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Journal of Educational Research

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Entered as second-class matter at the Post Office at Bloomington, Illinois under the act of March 3, 1879

JOURNAL OF EDUCATIONAL RESEARCH

This journal was established to support educational research workers in all phases of the great problems of teaching. Started in 1920 under the editorship of Dr. B. R. Buckingham and associates among the members of an association of directors of educational research, and accepted as the official organ of the Educational Research Association, its purpose has at no time been confined to a narrow line of specialized research but has been concerned also with professional applications for all workers in education.

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THE JOURNAL OF EDUCATIONAL RESEARCH is published at Bloomington, Illinois, monthly, except July and August by the Public School Publishing Company. The subscription price is $4.00; $4.20 in Canada or Mexico; and $4.50 in other foreign countries.

Subscriptions and all communications about reprints or other business matters should be addressed to the PUBLIC SCHOOL PUBLISHING COMPANY, at Bloomington, Illinois.

Address all communications on editorial matters to A. S. Barr, Department of Education, University of Wisconsin, Madison, Wisconsin.

JOURNAL *of* EDUCATIONAL RESEARCH

Volume XVIII NOVEMBER 1928 Number 4

ON COMPARING IQ'S AT DIFFERENT AGE LEVELS ON THE SAME SCALE

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IN the course of an investigation concerned with the comparability of test scores on different scales, a consideration came to the front which, it would seem, has not been adequately treated in the literature. It is the question of whether or not measures at different age levels on the same scale are comparable. It has apparently been assumed that so long as one uses the same scale the mental age description is adequate and that difficulty arises only when he wishes to compare the mental age secured on one scale with the mental age secured on another.[1] Franzen and Wilson in their discussions were concerned with inter-scale comparability rather than with intra-scale consistency.

Wilson[2] makes this significant statement to which we subscribe:

> "When standard scores and test ages stand side by side, it is the standard scores which are the more significant of what we usually want to know."

It must be kept in mind that the IQ is a hybrid resulting from two different kinds of series. The chronological age series is additive in the strict sense of physical measurement; the mental age series is not additive. It is ordinal or positional. According to it persons are ranked the one above or below the other. It is just this latter characteristic, in fact, which distinguishes an ordinal from an additive series. An IQ rating, then, ranks individuals. When we say that the IQ for an individual remains constant we mean that the individual maintains the same position with reference to the median individual and other individuals of

[1] Franzen, R. *Journal of Educational Psychology*, September, 1924; also Wilson, G. M., *Journal of Educational Research*, March, 1926.

[2] Wilson, G. M. "Standard Deviation as a Score Unit," *Journal of Educational Research*, March, 1926, p. 194.

his group, provided these in turn are constant. On theoretical grounds, therefore, it is not permissible to apply the ordinary calculus of additive series to results from mental scales. Theory thus limits us to the use of such calculating devices in ordinal series as the median or mode in preference to the means, and the interquartile deviation in preference to the standard deviation. But if in practice we limited ourselves to such devices, we should certainly not progress very far. The theoretic difficulty seems to be in part overcome, in practice at least, by the close agreement between the median and the means in a fairly symmetrical distribution or by the agreement between the standard deviation when calculated by the usual method and when calculated from the interquartile deviation. Undoubtedly it is this sort of agreement in practice which has justified the elaborate statistical methods in psychology and education. Thus practice has given rise to a pretty widespread use of the standard score. It is the distance of a particular raw score from the mean of the distribution to which it belongs, measured in terms of the standard deviation of that distribution.

The chief advantage of the standard score is that it permits the comparison between measures of very different things with one another. Franzen[3] has given a good illustration. Suppose we wish to compare the pulse of a child with his height. He is 12 years old. His height is 59 inches and his pulse rate is 86. Obviously his height and his pulse rate cannot be compared until these measures have been reduced to a common denominator. Suppose the average height of 12-year-olds to be 55 inches and the average pulse rate of 12-year-olds to be 78.

"Then this child is 4 inches above the average of his group in height and 8 pulse beats above the average of his group in pulse. We now know at least that he is above average in each though we do not yet know how much more, if any, he is above average in one than he is in the other.

"From these facts we could not tell whether being 4 inches above average in height means being as tall as 12-year-olds ever get or whether being 8 pulse beats above average is so common that as many as one out of every three children attains this superiority over the average. We therefore further translate these deviations from the average into what we shall here call 'Sigma Indices' by dividing each deviation by the variability of the group. In our example suppose that the variability of height is four inches and that of pulse, eight pulse beats. Then the child whom we are considering is one variability above the average of his

[3] Franzen, R. and Hanlon, W. H. *Program of Measurement in Contra Costa County*, 1923.

group in each of the characteristics measured. We have expressed his height and his pulse each as deviations from the average of his peers expressed in multiples of the variability of his peers."

Franzen resorted to the device of assigning arbitrarily one hundred as the average score for each age level and twenty points to each sigma. In this way the sign of the sigmas is ignored. An individual who is one sigma above the means of his age group has a sigma index (this is the name of the measure assigned by Franzen) of 120. If he is one sigma below the average of his group he has a sigma index of 80. If he is four sigmas below, he has a sigma index of 20 and if four sigmas above, 180. The sigma indices have the advantage of being very much like the IQ's on the Binet scale in size and in not differing from them widely in meaning. With the sigma index we can describe the pupil in terms of probability of success or failure, or the probability of his score's falling below or above a certain value as a direct property of the index itself.

The present problem is closely related to that of the constancy of the IQ, but differs in this respect: That the problem of the constancy of the IQ is concerned with the constancy of the position of the individual with reference to the average of his group; that is, with changes in rate of mental development of the individual. In our problem we raise the question whether or not on a given scale a child who maintains a constant position with reference to the average of his group will nevertheless secure different IQ's because the scale means different things at different levels.

Table I gives the means and standard deviations by years of two primary tests of intelligence widely used which we shall call Scales A and B.

TABLE I

MEANS AND STANDARD DEVIATIONS FROM STANDARDIZATION DATA, SCALES A AND B

	Years							
	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14
M_A	18.2	31.0	42.5	51.6	59.4	60.5	62.3	
M_B	25.0	44.7	58.6	66.9	72.3	79.9	82.9	82.1
O_A	10.7	15.7	15.3	14.6	14.3	15.1	14.2	
O_B	14.5	17.2	18.1	16.8	16.7	12.6	11.8	14.1

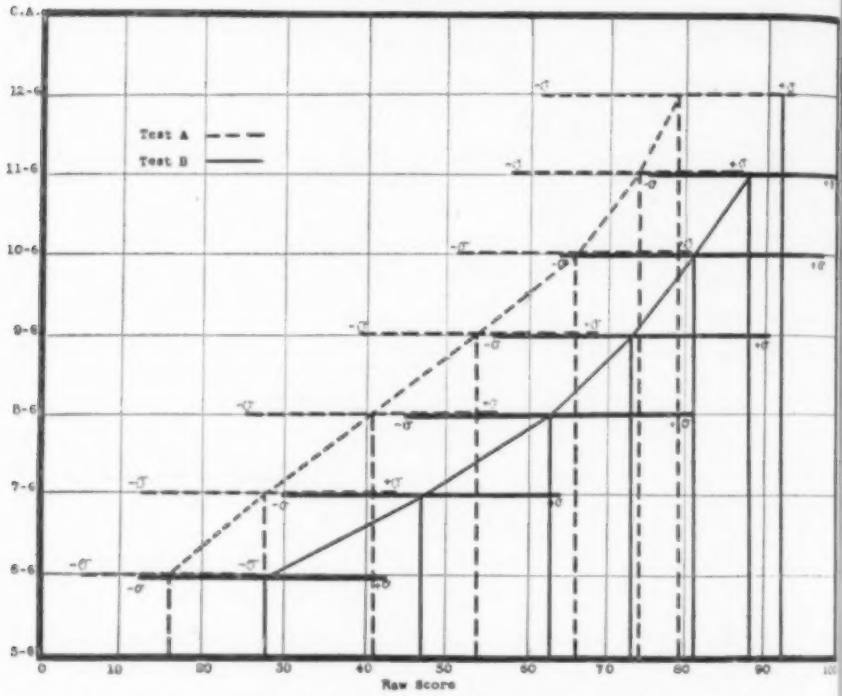
TABLE II

COEFFICIENTS OF VARIATION, STANDARDIZATION DATA, SCALES A AND B

	Years							
	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14
C.V.	58.8	50.6	36.0	23.2	24.1	25.0	22.8	
$C.V._B$	58.0	38.5	30.9	25.1	23.1	15.8	14.2	17.2

Table II gives the coefficients of variation for the two scales by years. In Figure 1 the standard deviations are those given in Table I, whereas

Figure 1



the medians or age standards are taken from the manuals of Tests A and B, respectively. In this diagram the column on the left, y-axis, is the scale of chronological ages at intervals of one year. The row at the bottom, x-axis, is the scale of the raw scores. The broken lines represent the results from Test A; the solid lines, those from Test B. The vertical lines are erected at the age standards in terms of the raw scores. For instance, the age standard for 7 years 6 months is at 28 in Test A; it is at 47 in Test B. The horizontal lines represent two standard deviations, a plus sigma and a minus sigma, of the scores at the several age levels. The vertical lines, of course, approach or cut the horizontal lines at the middle point. The broken horizontal lines have been raised slightly in order to avoid an overlapping with the solid lines.

It will be noted that the actual averages found in Table I differ considerably from the age standards given in the manuals in ages above eight and nine years. The age standards in the manuals are used in Figure 1 because these are the standards by which IQ's are derived. The

question may properly be raised whether the standard deviations derived from the data from which these means were calculated may properly be used in connection with the age standards in the manual. We may note, first, that differences in means do not necessarily imply differences in standard deviations. Second, the standards in the manual for higher ages, though hypothetical, are intended to meet actual situations. What the standard deviations are that should properly be associated with these standards, in the nature of things, must remain unanswered. It is worthy of note, however, that the standard deviations between ages seven and thirteen in the case of Scale A are practically constant, whereas the standard deviations at ages 11-12 and 12-13 on Scale B are rather out of alignment with the other standard deviations. Reference to Table III will show, however, that in the case of Scale A the IQ, corresponding to

TABLE III

CHANGES OF IQ WHEN THE INDIVIDUAL MAINTAINS A SIGMA INDEX OF 120 IN BOTH SCALES AND THE SAME WHEN HE MAINTAINS A SIGMA INDEX OF 80

	Years						
	6–6	7–6	8–6	9–6	10–6	11–6	12–6
Sigma Index	120	120	120	120	120	120	120
IQ_A	114	117	115	111	121		
IQ_B	112	114	124	126			
Sigma Index	80	80	80	80	80	80	80
IQ_A		82	85	88	89	86	83
IQ_B	86	89	87	85	82	84	

sigma index of 120, shows the greatest disparity between ages 9-6 and 10-6. This disparity can hardly be accounted for in terms of differences in standard deviations, since the standard deviations for these ages are practically the same and are consistent with standard deviations at other age levels. In the case of Scale B, the marked disparity in IQ's occurs between 7-6 and 8-6 which again obviously cannot be attributed to the difference in standard deviations for these two years since the standard deviations are approximately the same.

Moreover a glance at this diagram will show that the chief factor influencing the behavior of the IQ's is the differences in intervals between the age norms. In the higher reaches of ages the intervals tend to close up. This results in a tendency always for the plus standard deviation to cover a greater proportion of the year-intervals than the minus standard deviation and, in turn, accounts for the relative constancy of the IQ's corresponding to the sigma index of 80 as shown in Table III. It follows, therefore, from these considerations that an IQ of a given value above 100 derived by such instruments will, in many cases, mean very

much less than an IQ of the corresponding value below 100. The higher the IQ above 100, the greater is the disparity between the IQ and what ordinarily is supposed to be its significance.

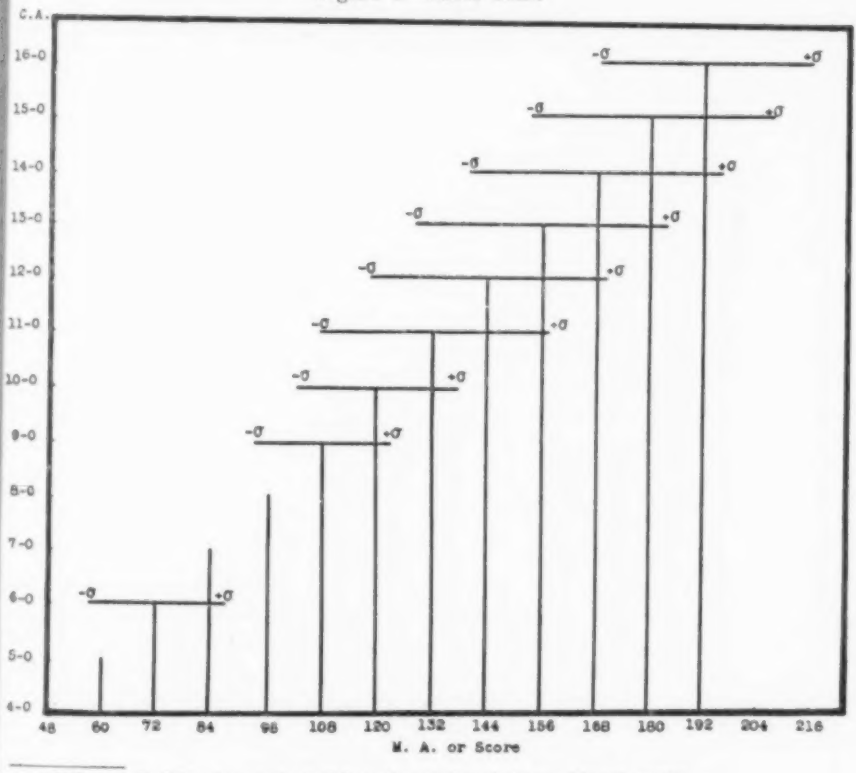
This phase of the problem has been subjected to limited experimentation. When Figure 1 had been completed, the junior author ventured the prediction that if a group of children that had been measured by Scale B at the age of 7-8 and whose IQ's lay between 110 and 120 were measured at age 8-9, the average IQ's would be approximately ten points higher. To test this prediction, from a large amount of data from measures of the same children at these ages forty such cases were available. These forty children had an average IQ of 114 at age 7-8. The same children measured by the same test at age 8-9 had an average IQ of 125, a difference of 11, which is undoubtedly significant. These children have been measured three times at yearly intervals by Test B. Hence this difference in average IQ's may be attributable in part, but hardly *in toto*, to practice effect. Except for this possibility, we seem justified in concluding from this test case that variations in IQ's without corresponding variations in ability, as described by the sigma index, take place in actual school situations.

Let us turn now to Figure 1. Keeping in mind that the broken line represents Scale A and the solid line Scale B, we may note the following facts: That an individual six years and six months of age on scale A who is one sigma above the average of his group is a little less than one year accelerated; that the same child maintaining a constancy of position in succeeding years will at the age of 7 years 6 months be more than one year accelerated and that this acceleration remains practically constant until the age of ten years six months when he is more than two years accelerated. That means that this IQ at six years six months is 114; at seven years six months, 117; at eight years six months, 115; at nine years six months, 111; at ten years six months, 121; and that this change in IQ occurs as a property of the scale by which he is measured and is not a function of the change in the child's rate of mental growth. In the case of Scale B we note that a child at 6 years and 6 months who is one sigma above the average for his age is about three-fourths of a year accelerated; that at 7 years 6 months the acceleration is slightly more than 1 year; that for age 8 years 6 months, however, he is two years accelerated; for age 9 years 6 months he is two and one-half years accelerated. This means that at 6 years 6 months his IQ is 112; at 7 years 6 months, 114; at 8 years 6 months, 124; at 9 years 6 months, 126;

et cetera. Table III shows the changes of IQ when the individual maintains a sigma index of 120 in both scales and likewise when he maintains a sigma index of 80. The general tendency is, therefore, for the low IQ's to become slightly lower, and the high IQ's to become considerably higher in the case of Scale B. The same can hardly be said of Scale A. So far as the low IQ's are concerned there is a slight increase. The important thing to note is that these changes are purely artifacts.

These findings suggested the possibility of making a similar study of the Stanford-Binet test. We may think of the scores on the Binet test in terms of mental age or as raw scores. The initial difficulty was that of finding standard deviations of mental ages at the different age levels. In 1925, Wilson[4] published a study which probably gives a fair estimate of the standard deviations of mental ages at 10-, 11-, 12-, 13-, and 14-year

Figure 2—Binet Scale



[4] Wilson, G. M. *Journal of Educational Psychology*, March, 1925.

levels. Those for ages 7 and 8 are omitted; that for age 9 is very questionable since it appears to be approximately the same as that for age 6. (See Table IV.)

TABLE IV

SIGMA OF MENTAL AGE IN AGE GROUPS
(WILSON)

AGE	MEAN SIGMA
6	14.83
9	14.65
10	18.15
11	25.18
12	26.02
13	27.62
14	28.33
15	26.95
16	23.73

Figure 2 gives the results of the application of our method of examination to the Binet scale.[5] It is certainly interesting to note that with these standard deviations at age 10, 11, 12, 13, and 14, given by Wilson, the IQ remains practically constant, though there is a slight change which undoubtedly is an artifact. Table V shows the variation

TABLE V

VARIATION OF BINET IQ'S BASED UPON WILSON'S DATA

AGE	IQ
6	121
9	114
10	115
11	119
12	118
13	118
14	117
15	115
16	113

of the IQ using Wilson's results. It will be noted that the sizes of the standard deviations increase with increase of age, and that the raw-score interval between age levels, which is the same as the mental age interval between years, is constant, it being always 12. Now, if we turn to Table I and consider Scales A and B, we find a striking contrast. In the first place the standard deviations for the different age levels in terms of raw scores maintain a remarkable constancy, and in the second place the raw score intervals between age levels are not constant but decrease, at first slowly and then rapidly, with increase in age level.

From these considerations it follows that in any age scale, if the IQ is to be constant, there must obtain a certain proportional relation be-

[5] It should be noted that Wilson used results from group tests as well as from the Binet scale. In the opinion of the authors, these group-test data tend to vitiate the results so far as the Binet test is concerned.

tween the standard deviation at any age level, in terms of raw scores, and the interval between age levels. If the intervals between the age levels are constant, then we can determine purely from mathematical considerations what the standard deviations must be, provided we know accurately the standard deviation at some particular age level, and therefore what must be the acceleration for the successive age levels. In the case of the Binet test, column 3 of Table VI illustrates what the acceleration

TABLE VI

MENTAL AGES, AMOUNTS OF ACCELERATION IN MENTAL YEARS, AND THE SIGMAS IN MONTHS FOR AGES 6 TO 16 RESULTING FROM THE EQUATING OF IQ 117 TO SIGMA INDEX 120

C.A.	M.A.	AMOUNT OF ACCELERATION IN MENTAL YEARS	SIGMA (MONTHS)
6	7.02	1.02	12.24
7	8.19	1.19	14.28
8	9.36	1.36	16.32
9	10.53	1.53	18.36
10	11.70	1.70	20.40
11	12.87	1.87	22.44
12	14.04	2.04	24.48
13	15.21	2.21	26.52
14	16.38	2.38	28.56
15	17.55	2.55	30.60
16	18.72	2.72	32.64

at the different age levels must be in order for the IQ to be constant. The first column shows the chronological age; the second column shows the mental age when the individual is one sigma above the average of his group; the third column shows the yearly acceleration; the fourth column shows the size of sigma in mental months. The IQ is 117 which corresponds to the acceleration of one sigma. The table is constructed on the assumption that Wilson's results for ages 10-14 are acceptably correct.

The following is offered as an explanation of Table VI. As everyone knows M.A. = C.A. $\times$ IQ, but as indicated above, M.A. = Score. Therefore, we may write Score = C.A. $\times$ IQ. Column 2 results from this operation. Being one sigma above average according to Wilson's data for ages 10-14 means an IQ of approximately 117. Empirically, then, we may say that in order to have an IQ of 117 on the Binet scale, one must be one sigma above the average of the means of his age level. Keeping this in mind, we may turn the process about and proceed to determine the size of the standard deviations at any age level from the IQ of 117. Column 4 results from this consideration.

The last column of Table VI is very valuable because with the data here given we are able to construct sigma index tables which will cor-

respond to the sigma index tables derived for scales A and B. Provided these estimates are correct, it would then be possible to compare any group tests, if the sigma index tables are available, directly with the results from the use of the Binet scale.

In the opinion of the authors, also, the procedure here will enable another approach to the problem of the constancy of the IQ. When sufficient data from the Binet scale are available from unselected groups to determine the sigmas at various age levels, we can determine from them approximately whether the IQ on the Binet scale is constant. It is certainly worth noting that if we accept the data collected by Wilson as shown in Table IV one of two possibilities presents itself (see Table V):

(a) If the IQ derived empirically from the Binet tests is constant, then the relative ability of the child is not constant, but varies according to some unknown law with which the Binet tests happen to be in conformity.

(b) If the child's ability remains constant and the sigma deviation from the means is a measure of that constancy, then the empirical IQ's upon the Binet test are of necessity not constant.

SOME ECONOMIC CONSEQUENCES OF EDUCATION

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INTRODUCTION

"EDUCATED people receive higher wages not because they are educated but because educated people are scarce." This statement of fact, expressed so well by Professor Edie, raises two questions, one concerned with wages and the other concerned with a more intelligent direction and support of educational efforts for those who will become the educated people as well as for those who can become only educationally trained people. It is possible that however great the supply of the educationally trained there may remain a scarcity of those who are the really educated people whatever the source of their training. A larger supply of educationally trained people will, it may be assumed, benefit society economically, as well as in other ways, though not tending to increase or even maintain the level of wages.

The discussions of the economic effects of education have, in the past, been largely confined to considering the increased incomes of the individuals who received the education. Incidentally many assumed that schooling had some magic effect on society as a whole. This lack of scientific study has given rise to two extremes of opinion—one as faulty as the other. The first considers that any amount of money can be spent for education because by some automatic process of evaluation education more than pays for itself. The other school seeing the economic fallacy in this viewpoint goes to the opposite extreme, considers education entirely unproductive and says that it must be paid for out of the production of other activities and to that extent is an economic drain upon the community. We shall consider each view in more detail later.

A systematic consideration of the economic effects of education would demand a reasoned discussion of the effects upon production, distribution and consumption of wealth. Education has crucial effects upon production and possibly could have larger effects upon consumption than upon either production or distribution. However, space will limit the following discussion largely to distribution.

Distribution in modern economics is concerned with the share of the product that goes to each factor that helped in production. The his-

toric classification of these factors is land, labor and capital.[1] We shall be particularly interested in the part going to labor (including salaries) and the laws governing its distribution.

HOW FAR DOES EDUCATION AFFECT EARNING POWER

What is the common opinion in America in regard to the effect of education upon the distribution of wealth to the person who has the education? What is the effect of education upon earning power? After a careful study of several scores of articles that purport to answer the question, we can state that their almost unanimous conclusion is that education increases earning power and generally increases it very largely. The common form of the statement is that "every day in school will bring an increased financial reward." Some of the articles say that it is eight dollars per day, some ten, twelve or some other figure.

As we shall disagree radically from these accepted views it may be well to give the theoretical grounds for the position to be taken. A few quotations will be given from leading economists in America and England to indicate some of the factors that determine wages and salaries.

Carver, Thomas N. *The Distribution of Wealth.* p. 165.

"The wages of any particular kind of labor depend as much upon its supply as upon its demand; labor like all other factors must be limited in supply in order that it may command price."

Clark, John Bates. *The Distribution of Wealth.* p. 178.

"The effective value of any unit of labor is always what the whole society with all its capital produces, minus what it would produce if that unit were to be taken away. This sets the universal standard of pay."

Taussig, F. W. *Principles of Economics.* 3rd ed., Vol. I, p. 99.

"In the community it (the wide diffusion of education) tends to raise general efficiency, it may tend to lower the earnings of those with technical or professional skill."—"They forget that if all men could easily procure the training for the better occupations, numbers in that occupation would be greater and pay in it would be less."

Marshall, Alfred. *Principles of Economics.* 8th ed., p. 576.

"The market price of everything is determined mainly by the relation in which the demand for it stands to the available stocks of it."—Page 532: "Thus again we see that demand and supply exert coördinate influences on wages."

These quotations are interpreted to mean that in the distribution of wealth the wages received by an individual depend upon the demand for his services in relation to the supply of such services offered.

[1] See Edwin Cannan, *A History of the Theories of Production and Distribution.*

SUPPLY AND DEMAND OF COLLEGE GRADUATES

There are about 800,000 students in the United States in institutions of or above college grade. A large proportion, if not most, of these are preparing for the professions of law, medicine, engineering in all its branches, teaching, ministry, dentistry, architecture, journalism and so on. The total employed in all these professions in America is about twice this 800,000.

Wages (including salaries) are governed by the supply for service in relation to the demand. Is it a reasonable question to ask what will happen to professional salaries when the 800,000 goes to 1,000,000 and to 1,500,000 as it surely will? Even of the almost 4,000,000 high-school students the attempt seems to be to try to get as many as possible in the professions and clerical occupations. Each day someone answers that schooling is worth eight dollars, ten dollars or some other amount depending upon the last article he has read, dealing with the money value of schooling.

SITUATION IN THE PAST

Are there any facts in the past that will enable us to guess more correctly what will happen from the pressure of these large numbers of people with advanced education trying to get into a limited number of positions? The fall in the salaries of clerks in the last hundred years is enlightening. A hundred years ago clerks were relatively highly paid. Since then there has been a tendency for the real wages of clerks to drop. "There is a plethora of persons qualified to do clerical work and a consequent tendency of their wages to fall rather than to rise."[2]

You cannot train 100,000 people for 90,000 jobs without creating pressure to decrease the remuneration of the 90,000. You cannot have 800,000 people in college year after year and expect them to compete for 1,600,000 jobs without lowering salaries sooner or later. You cannot have the present percentage in high schools and expect them all to go into the "higher callings." If all tried to do so salaries would drop to unbelievable levels. The "higher callings" might even be more overcrowded than the field of unskilled labor is today.

For fear there may still be some people who are misled by the "facts" of popular articles purporting to give the money value of edu-

[2] Taussig, F. W. *Principles of Economics.* Vol. II, p. 147.

cation we shall look at the studies which have been made. With a few exceptions the articles have compared the earnings of a group of people, who went to college or high school, with the earnings of a group which did not. It was concluded that because the group which had the most schooling made the most money, that the schooling had something to do with it. What about the ability and advantages, other than schooling, of the two groups?

We should like to suggest that a study be made of boys who spend more than $2,000 per year while in college, compared with a *random* group of college boys. The chances are that the boys who spend more than $2,000 per year while in college will later have larger incomes, on the average, than the boys in the random group. Why? Because they spent the $2,000 per year? No! The $2,000 per year had no more to do with it than the schooling. The very fact that they had $2,000 per year to spend, means that as a group, they came from homes of wealth. They will have the best openings in business and the professions and will inherit money. Boys who spend the summer living in expensive hotels in summer resorts will probably have larger incomes in later life than boys who work during the summer. Shall we conclude that boys should spend over $2,000 per year while in college and live in expensive hotels in summer rather than work? Not at all. Living in the hotel or spending the $2,000 had no more to do with the money later made, than the going to school.

PRESENT FACTS

The results are too meagre to be depended upon, but they support entirely the theoretical arguments before presented, that schooling as it is at present is not likely to increase earning power. The purpose of this paper is to call attention to the theoretical argument and to show the need for more data.

The real question is, what will be the difference in income between two groups of boys of equal ability and advantages, one group going to school several years longer than the other? There may be a study of this character in print but a rather careful search for it, over two continents and for several years, has failed to disclose it to the present writer. Consequently he has been collecting what little data he could on the problem.

Probably most of the ability of the country goes to college today. If the result is to try to force much or most of this ability into certain lines

of work, we would expect competition in these lines to be keen and that wages in them would have a tendency to fall. This tendency will be much more evident in the future, as the number gets larger and larger. On theoretical grounds we should expect schooling of college level, which, even if called cultural and not vocational, tends to put people in a definite and limited range of occupations, to reduce earnings of those people. The limited facts available seem to support this conclusion.

INTERPRETATION

The question will be asked, then does all schooling tend to reduce income? No. This may seem hard to understand in the light of what has been said before. The data seem to show that the age to which schooling pays the individual is somewhere between 14 and 18, or in high-school period in America, and that much schooling seems to increase earnings. It may be that so long as the schooling is common for all or is not differentiated so as to crowd certain occupations, it increases income.

The original question remains, what are the economic consequences of education? Some rash soul who feels that taxes are too high says that here at last is the proof that we are spending too much for schools, but he is wrong again. The proof of such a statement is not here. To calm the nerves of those who fear the doctrines here mentioned will destroy the support of education, the following facts should be remembered.

1. This paper has not gone into the question of production. It is possible that education increases enormously the total production of society, an interesting question but one that cannot be discussed here. Increased production could result from schooling and still the point of this paper be sound.
2. The consumption of wealth has not been considered and in many ways this is the most important part of the whole problem.

Certain suggestions and conclusions seem to follow from the above discussion.

1. So much of a particular kind of education can be supplied that it will not produce an economic return. As some economists would say, the marginal net return from a given grade of ability is less than a maximum, due to the fact that already some people of this grade of ability could be better employed in other channels. This is the present situation judging from the best facts available.

2. It is a useless waste of breath to talk about schooling paying or not paying. Certain kinds of schooling in definite amounts do or do not pay economically. The discussion we need in the future is in regard to a definite amount of a definite kind of schooling. A sharp distinction must be made between the kind of schooling that does pay and the kind that does not. Each kind will be provided and in increasing amounts but for different reasons. One pays for itself, the other must be paid for out of the social surplus. One is a factor of production, the other a factor of consumption. Education will never receive the support it deserves until the point is made clear.
3. For those people who want to tell a student that he will make more money by going through high school or college, this paper demands a type of proof that has not been presented in the past. It is still quite safe to tell an able boy that if he will go to college he will make more money than a very much less able boy who does not go. There is some evidence (uncertain) that he will make less than a boy of equal ability[3] who does not go.
4. This paper suggests (by implication) the amount that should be paid to teachers on purely economic grounds.
5. This paper has dealt with schooling largely as it is and does not say what would happen if certain curriculum changes were made or if certain schemes of "vocational" education or vocational guidance were adopted. It does not say less academical schooling should be provided. It simply says that if as large a proportion of those who have had the academic education continue to go into certain occupations and professions, wages in these occupations will fall and the schooling will not produce a maximum economic return.
6. If all the people are to be educated the scope of education must be broadened if the best economic results are to follow.
7. Some people try to defend each part of the present system of education on economic grounds. It can't be done; the facts are not available and they would probably support an opposite conclusion if they were. Much schooling cannot be defended on economic grounds but can and should be defended on other than economic grounds. It is the author's opinion (not to be confused with the facts) that the

[3] Whether the able or fortunate boy gets too large a share of all income is not a point at issue in this paper. It is entirely possible that the boy who goes through college and the able one who does not both earn too much.

social surplus in America is large enough to provide much more schooling than is provided and which does not pay for itself, if this is desirable.

8. Some timid soul will say this reasoning should never be allowed, it is destroying the basis of our support for education. Such a result does not follow as this paper says nothing about the economic effects of schooling upon society as distinct from the individual. It is possible for schooling to increase the income of society and at the same time decrease the income of many of those who get the education.

As was said in the beginning, the effect of schooling upon production and consumption is another study and a most important one. This discussion deals with the effects of schooling upon distribution. The present unsound propaganda for the support of education is sure to be exposed. It is better that it should be done by a friendly critic than by one opposed to education.

This discussion is offered in the hope that it will lead to sounder consideration of the economic results of schooling and thereby lead to more and better schooling for all the people.

THE PRACTICAL APPLICATION OF THE STUDENT'S ABILITY INDEX

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IN seeking to make practical use of a Student's Ability Index (SAI) based on teachers' marks it is evident from the formula:[1]

$$SAI = \frac{Mk}{CA} \cdot \frac{MGA}{GMk}$$

that our chief problem is to find a workable value for the grade constant $\frac{MGA}{GMk}$, the average mental age for the grade divided by the mark of the student of average ability for the same grade. In other words, what is the norm per grade for this ratio? This may be fixed if we can decide on a suitable norm per grade for each factor of the ratio.

Let us consider, first, a workable norm for MGA, the mental grade-age, or the average mental age per grade. Fundamentally the grade curricula in our schools are organized on the assumption that all children have like mentality and should make uniform progress through the schools, entering the kindergarten, according to the Rochester Rule, at the semester beginning nearest the fifth birthday and each succeeding grade at one year intervals. If such assumption were true the value of MGA would be constant for each grade in every school and could be read directly from the chronological grade-age. For rough approximations these values may serve a purpose, but in practice we find that the assumptions do not hold.[2] Not only is there a general divergence of both mental and chronological age distributions per grade from the basal Rochester norm but the two age divergences are not correlated. It is, therefore, evident that in the interests of accuracy the mental grade-age must be determined independently of the chronological age.

It would seem obvious that the best and the most practicable value for a standard MGA would be derived from the results of a mental test

[1] Banker, Howard J. "A Students' Ability Index from Teachers' Marks." *Journal of Educational Research*, XVII (May, 1928), 357-364.

[2] Banker, Howard J. "Age Distribution in the Grades as a Measure of Mentality." *Journal of Educational Research*, XIII, (March, 1926), 155-170.

based on as large and typical a body of students as it may be possible to obtain. We know of nothing superior to the tests of 1,936 California children made by Terman and his coworkers which we have previously discussed.[3] While such a mental-age distribution may not be typical of all schools and of every community, we believe that it furnishes the ground of a standard approximation more reliable than any that may be obtained elsewhere. Hence, there appears to be nothing of more practicable service for our purpose than the median mental-age at entrance per grade given in column 6 of Table III in the paper cited.[4]

It may be observed that the difference in mental-age per half-grade is just .52 of a year on the assumption that the half-grade is the equivalent of a half year. Therefore, the mental-age value for any period after the beginning of the school year may be determined accurately by adding to the mental-age at entrance to the first semester .02 times the number of elapsed weeks. Whenever any grade falls in the second semester of the year the mental-age at entrance should be corrected by this method, if such accuracy is needed, since the semesters are not commensurable with the half-years.

The determination of a normal value for GMk is a more difficult problem. Since teachers' markings are far from being standardized and are especially subject to variation both from the personal equation of the teachers and from indeterminate school policies, it is evidently impossible to fix on a teachers' mark for the student of average ability that could be regarded as a universal norm. Here is the *bete noir* of our problem. Perfection is not sought or expected. It is not possible to correct absolute errors of measurement, but we have sought to find an interpretation of teachers' marks that will approximate more nearly to the truth than has yet been accomplished. We can throw neither the teachers nor their marks into the limbo. It will be the part of wisdom to determine their best possible interpretation.

We have previously indicated how the variability due to the personal equation of the teachers may be greatly reduced though not wholly eliminated.[5] Another important disturbing factor in the application of

[3] Banker, Howard J. "Age Distribution in the Grades as a Measure of Mentality." *Journal of Educational Research*, XIII, (March, 1926), 155-170.

[4] *Ibid*, p. 166.

[5] Banker, Howard J. "A Students' Ability Index from Teachers' Marks." *Journal of Educational Research*, XVII (May, 1928), 357-364.

our formula is the lack of any standard system of marking in general use in our school systems. The disturbing effect of this factor may be eliminated in some degree by restricting the determination of the average mark in any given case to the school system or portion of the school system in which the markings are on a fairly uniform scale. This requirement may confine us to a single school or to a system of schools under one administration; at least, the same marking system or such systems as may be reduced to the same standards should be used throughout. The results must here depend upon the degree of coördination affected by the restrictions in the scope of the work. To what extent such restrictions are to be applied must be determined by the local conditions, the nature of the problem and the judgment of the worker.

Under ideal conditions we should expect that the mark of the student of average ability, that is, the student whose $\frac{MA}{CA} = 1$, will be the arithmetical mean teacher's mark for the population on the ground that the student of average intelligence will accomplish an average achievement in the school work. This would be true if the score marks of achievement, that is, the teachers' marks, were distributed in strict conformity with the normal probability curve. This is on the assumption, quite generally accepted, that intelligence or mental ability in the normal homogeneous population is distributed about the average in conformity with such a curve.

We have previously seen,[6] however, that distributions of teachers' marks do not conform to the normal curve but, on the contrary, are distinctly and definitely skewed. The distribution of achievement in the population as measured by teachers' marks presumably does not coincide with the distribution of intelligence. There appears to be no precise method of determining the location of the student of average intelligence in such a distribution. Greenwood and White, working on a medical problem concerning the opsonic index and involving somewhat similar skewed distributions, suggested that "the mode would be a far better constant for the determination of the opsonic index than the mean."[7] It may be considered that a teacher does not consciously mark about the mean or the median as an average for these are mathematical points not

[6] Banker, Howard J. "The Significance of Teachers' Marks — I. The Law of Their Distribution." *Journal of Educational Research*, XVI, (October, 1927), 159-171.

[7] Greenwood, M. and White, J. D. C. "A Biometric Study of Phagocytosis with Special Reference to the Opsonic Index." *Biometrika*, VI, (March, 1909), 376-401.

evident to the senses. On the other hand, undoubtedly there is a tendency to mass the marks about what appeals to the teacher as the point of average accomplishment in the class and there form a mode. While this may not coincide with the mathematical mode it is a predetermining factor in the location of the latter and approximates its position more or less closely. The final solution of this question appears to depend on experience.

In order to test the practical working of our formula and incidentally to find, if possible, the most satisfactory value for GMk, the SAI's were computed from the teachers' marks in School B described in a previous paper.[8] To this end tables of the values of the grade constant $\frac{MGA}{GMk}$ per grade were computed. The value for MGA per half-grade was taken from column 6 of our Table III as previously cited[9] corrected as we have indicated for the end of the first semester when the final average marks of each pupil were recorded. For GMk several values were tried for the purpose of comparison; first, the median mark for all grades in the whole town system, 82.17;[10] second, the median mark for all grades in School B alone, 85.18,[11] and third, the median mark for each class in School B separately.

In like manner the mode for the whole town system, 84.07,[12] the mode for School B, 88.35,[13] and the mode for each class in School B were employed. In this way six series of SAI's were obtained based on the average teachers' marks for the same 508 students in Grades I to VIII and were designated as follows: SAIa, based on the median for the town system; SAIb, based on the median for the particular school (B); SAIc, based on the median mark for each class severally; SAId, based on the mode for the town system; SAIe, based on the mode for the particular school and SAIf based on the mode for each of the sixteen classes.

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[8] Banker, Howard J. "The Significance of Teachers' Marks." *Journal of Educational Research*, XVI, (October and November, 1927), 159-171; 271-284.

[9] Banker, Howard J. "Age Distribution in the Grades as a Measure of Mentality." *Journal of Educational Research*, XIII, (March, 1926), 155-170.

[10] Banker, Howard J. "The Significance of Teachers' Marks — II. Marks a Function of the Student's Ability." *Journal of Educational Research*, XVI, (November, 1927), 271-284, especially Table III, p. 282.

[11] *Ibid.*

[12] *Ibid*

[13] *Ibid.*

We have not space to present the entire series of tables but Table I gives the mean SAI for each of the above described six series.

TABLE I

MEAN SAI AS COMPUTED FOR THE SAME 508 STUDENTS WITH VARIOUS VALUES OF GMk

GMk BASED ON MEDIANS		GMk BASED ON MODES	
Series	Means	Series	Means
SAIa	103.19	SAId	100.85
SAIb	99.94	SAIe	96.20
SAIc	100.75	SAIf	99.43

Average for whole six series 100.06

It is evident that in general our SAI's tend to approximate 100 as a central tendency. It is also evident and a matter of satisfaction that a considerable variation in the average of teachers' marks selected as the value of GMk does not give excessive divergences in the distribution of the SAI's.

Since our formula in its tentative application to the conditions in School B has given SAI's approximating a mean of 100, which is believed to be the value of the mean IQ for the general population, it is of special interest to see how the distribution of the SAI's compares with the distribution of IQ's in general. We have, therefore, sought such comparison with the distribution of IQ's given by Terman in the case of 905 unselected children, 5 to 14 years of age, when making the Stanford revision of the Simon-Binet tests.[14] Also the SAI distributions were compared with the distributions of IQ's from Binet tests obtained by Dr. Strachan, psychologist for the public schools of Kansas City, Mo.[15]

The latter is the most extensive compilation of IQ's from Binet tests which we have been able to find. It presents two series of distributions of the "intelligence quotients of unselected white children" in Kansas City public schools. The first series consists of 14,463 children tested in the kindergarten, first- or second-grades in the "three years ending June, 1924," and the second series consists of 6,063 children tested in the kindergarten, first-, second- or third-grades during the "school year 1924-5." I understand that none of these were duplicates.

The SAI's were grouped by the percentage of frequencies in ten-point intervals having the mid-points at 60, 70, 80, etc., corresponding

[14] Terman, Lewis M. *The Measurement of Intelligence.* (Boston: Houghton Mifflin Company, 1916), p. 66.

[15] Strachan, Lexie. "Distribution of Intelligence Quotients of Twenty-two Thousand Primary School Children." *Journal of Educational Research,* XIV. (October, 1926), 169-177.

to the grouping of Terman's and of Strachan's distributions of IQ's in the works cited. In Table II we have given the result of the comparison. It is strikingly evident that the several SAI series have about the same range and conform well to the IQ distributions. The need of some measure of the closeness of fit to the Terman distribution was felt and a rough index was improvised by determining the average difference per group between Terman's IQ percentages and the percentages of each of the other distributions. These are given in the bottom line of the table.

It is seen that SAIf gives the nearest approximation to the IQ's with SAIe second. That is, SAI's based on an average grade mark (GMk) for each class, or rather each teacher, separately, give distributions more closely approximating typical IQ distributions than when based on averages determined from larger and more heterogeneous groups of marks. However, this may be, and probably is, a spurious fit.

TABLE II

PERCENTAGE DISTRIBUTION OF SAI'S COMPARED WITH IQ'S

MIDPOINT INTERVALS OF 10	TERMAN 905	STRACHAN 14,463	STRACHAN 6,063	SAIa 508	SAIb 508	SAIc 508	SAId 508	SAIe 508	SAIf 508
60	.3	.6	1.2	.2	1.0	.8	.2	1.4	.8
70	2.3	2.2	3.0	4.3	5.1	3.3	4.9	7.1	3.7
80	8.6	7.8	9.0	7.7	8.7	9.3	8.7	12.6	9.8
90	20.1	19.2	20.2	18.3	22.0	19.7	21.5	24.0	22.4
100	33.9	30.7	32.2	20.7	22.0	25.0	21.3	24.4	27.2
110	23.1	26.2	23.7	24.2	26.2	28.1	26.8	23.6	23.6
120	9.0	10.3	8.8	19.3	13.2	10.6	14.4	6.3	10.0
130	2.3	2.3	1.6	4.7	1.6	3.1	2.2	.6	2.4
140	.5	.4	.4	.6	.2		.2		
Index of closeness of fit	F	1.1	.6	3.5	2.9	2.2	2.9	3.2	1.6

In fixing on any mark for "GMk" such mark determines the "100" of the index. Therefore, when "GMk" is found for each class separately the SAI's for the class tend to distribute about 100 as the average, that is, each class is unwittingly assumed to be a type of the general population. If this could be accepted as true the results would be highly satisfactory since the formula would then serve to reduce the several standards of marking by various teachers to a common denominator. That is, if two teachers marked a class relatively alike but one with a high average and the other with a low average, the distribution of SAI's from both would be essentially alike and yield the same average SAI.

On the other hand, two classes, differing materially on the average in ability for achievement and marked by a common standard correctly as to their performances, would still have a like distribution of SAI's, if

"GMk" were taken as the average in each set of marks independently. As we cannot assume that different classes are of like average ability we must have a common standard "GMk" if we are to compare individuals from different classes. With a single standard grade-mark for all classes, it will be possible by correlation studies based on the same classes from grade to grade, to detect the teacher whose marking average is greatly at variance with that of his colleagues. However, if a student's grade of achievement as a whole is measured by the average of his performance under all his teachers, the discrepancies due to varying standards may be largely averaged out.

With a single fixed standard grade-mark (GMk) for a body of students, it is evident from the formula that the relative value of the SAI per student will be determined wholly by the ratio of the student's mark to his chronological age $(\frac{Mk}{CA})$ since the ratio $\frac{MGA}{GMk}$ is a constant. In many cases, therefore, it is not essential that GMk be determined with absolute accuracy, yet as a rule it is desirable that it should approximate as closely as possible a value that will yield a mean SAI of 100 in a typical normal population.

Comparing Tables I and II it is seen that, of the series based on a single standard grade-mark, SAIb and SAId give the closest fit to the IQ distributions and yield in each case a mean closely approximating 100. These two series are based respectively on grade-marks 85.18 and 84.07. The latter is the mode of the distribution of teachers' marks in the school system from the whole of which our students are drawn. This fact confirms the theory that the mode of a skewed distribution determines most nearly the mark of the student of average ability.

If our 508 students are fairly representative of a normal population and the teachers' marks are typical of percentile scale marking, neither of which assumptions seems unwarranted, it would appear from the above grade-marks shown to yield the SAI series most closely conforming to the IQ distributions, that 85 could be reasonably adopted as a simple and convenient average grade-mark or GMk for most practical purposes. From the grade-mark 85 a final series, SAIh, was computed which gave a mean SAI for the 508 students of 100.12 and a percentage distribution as follows:

Midpoints	60	70	80	90	100	110	120	130	140
Percents	.8	4.9	9.1	21.7	21.9	26.6	13.4	1.6	.2

The index of closeness of fit to the Terman distribution is 2.9. If any school system has a radically different marking scale which cannot be reduced to the marking system here discussed it may be necessary to determine a working average by a special investigation of the local conditions.

It would have been desirable but was impossible to determine the Binet IQ for each of these 508 students. Such a series would have furnished a much more reliable distribution with which to have compared the distribution of our SAI's. The computation of SAI's may be of value to educators as a more scientific method of standardizing the markings of teachers than requiring them to conform their marks to a normal probability distribution. Having adopted a fixed average grade-mark for the institution, compute the SAI's from the teachers' marks and check against a reliable mental test as a standard. The discrepancies will show the weak spots in the school marking system.

A CRITICAL STUDY IN THE OBJECTIVE MEASUREMENT OF CHARACTER

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Despite the criticism of skeptics, the movement for the measurement of character has gone forward rapidly. Watson lists thirty tests published in the field of measurement in Religious Education.[1] Henderson describes forty-two tests of objective measurement of character traits, and gives 125 references to published material in this field alone.[2]

Character tests fall, for the most part, into four groups: First, rating scales, such as the Upton and Chassell (Measurement of Citizenship) in which the person either rates himself or is rated by others in specific traits. Second, tests of temperamental traits like the Downey-Will Temperament Test which measures a specific reaction in a controlled situation and infers the temperamental or character trait. The third, and in this third group fall the majority of the present measurements, are paper and pencil tests, in which, in various forms, an artificial situation is set up through a description of the circumstances and the student asked to check the response he would make were the situation genuine. The Kohs Ethical Discrimination Tests illustrate this type. The fourth is a series of controlled situations calling for conduct under normal life situations, such as the Voelker tests.

It is the purpose of this article to discuss the weakness of these paper and pencil tests and to show the absolute necessity of making tests presenting actual life situations.

Any and all of the pencil and paper tests measure only the individual's knowledge of right conduct. They rest upon the absolutely false assumption that knowledge of right conduct guarantees conduct. The fact that a child checks the right answer in a three-choice situation, or underlines the word indicating his knowledge of right conduct, in no way assures

[1] Watson, Goodwin B. *Experimentation and Measurement in Religious Education.* Association Press.

[2] Henderson, Frank. "Objective Measurement of Character Traits." Thesis, 1927, University of Rochester.

us that when faced with the actual situation he will act in accord with his knowledge.

To test this thesis two independent researches were carried on during a period of two years, the first in a secondary school, the second in a large junior high school.

In the first experiment,[3] 124 high-school students were given a questionnaire followed by two actual situation tests in order to determine their knowledge of right conduct. The results of the first showed that children know the meaning of honesty. To the question, "What traits do you most admire in your friends," 84 ranked honesty first; to the question, "What is your definition of honesty?" one or more of the following phrases were included in practically every answer; truthfulness, uprightness, fairness. Chambers sums up this part of his thesis as follows: "From the replies to the questionnaire, from the number of times that honesty was mentioned in the choice of the most desired qualities in their friends, from the definitions of honesty, it is apparent that the boys knew and admired all that is implied in the term honesty."

To determine if this knowledge as shown by the tests guaranteed right conduct, two tests of conduct in life situations were carried out. During the mid-term test the teacher left the room and with a pocket mirror observed the class. The following percentage of pupils in each class cheated on the test:

Freshmen	26%
Sophomores	32%
Juniors	48%
Seniors	45%

And this despite the fact that each knew that he would write at the end of his paper the declaration, "I do so declare that I neither received nor gave help in any way in this examination!"

The second test was arranged in daily drill material, with a recheck test to determine the number of students who corrected the first paper while the teacher read the correct answers. Students doing less well on the recheck test than on the original obviously made corrections on the first test before handing it in. Forty-one percent cheated on the daily material, the class percentage distributed as follows:

Freshmen	33⅓%
Sophomores	48 %

[3] Chambers, Edward V. "Study of Dishonesty," Thesis, 1926, University of Rochester.

Juniors	39 %
Seniors	54 %

It is obvious from this study that the only test of value in measuring character is that which measures it in actual situations, rather than in paper and pencil tests of knowledge of right conduct.

To check this conclusion still further, an experimental study was conducted in a junior high school, involving 186 pupils from grades 7A to 9A, inclusive. A test was devised involving fifteen typical junior high-school situations, each with questions attached.

In order to insure the usual classroom atmosphere the test was given during the social studies period, with the following explanation:

There are fifteen statements listed below and three questions under each. Check the *one* which you think you would do in each case. Read these carefully and be honest in your answers. Take all the time necessary. You need not sign your name to the paper. The list of questions is given below:

I. If, while you were playing you were dared to throw a stone at a street light, should you
   1. Take the dare and throw at the light?
   2. Refuse to throw at it?
   3. Pretend to take the dare but plan not to hit the light?

II. If, while you were playing, a street light was broken by some one in your crowd and you were asked about it, should you
   1. Say you knew nothing about it?
   2. Tell which one of the crowd threw the stone?
   3. Take your share of the blame as one of the crowd?

III. If, when you are on an errand at the store, you receive 10 cents too much in change, should you
   1. Keep it and say nothing?
   2. Return it to the clerk?
   3. Buy candy for someone else?

IV. You borrowed 25 cents two weeks ago. The person from whom you borrowed it has evidently forgotten it.
   1. Should you wait to return it until you are asked for it?
   2. Should you pretend to have forgotten that you borrowed it?
   3. Should you pay as soon as possible?

V. As you go into a store you see very tempting candy on an open shelf. Should you
   1. Take just a bite?
   2. Not touch it even though you want it?
   3. Take some for yourself and your friend?

VI. If you find a pocketbook containing money, should you
   1. Take it to a lost and found office at once?
   2. Take it home to think what to do?
   3. Hide it and keep it for yourself?

VII. If, when you enter the street car, the conductor does not notice that you pass him without paying, should you
   1. Slip out without paying unless he calls to you?
   2. Pay your fare?
   3. If asked, say that you had paid?

VIII. You have found a padlock which does not belong to you. Should you
1. Turn the padlock in to the office and get the dollar refunded?
2. Keep the padlock to use in case you should lose yours?
3. Take the padlock to the lost and found desk at once?

IX. You have accidentally torn a library book. Should you
1. Return the book immediately and offer to pay the damages?
2. Return the book but say nothing of the torn pages?
3. Think that leaving the book makes no difference as it belongs to no person in particular?

X. Some disturbance, which was your fault, occurred in the room during the teacher's absence. When she asked for information about the trouble, should you
1. Raise your hand and admit that it was your fault without further question?
2. Sit quietly unless she accused you?
3. Deny any knowledge of the affair?

XI. If the teacher leaves the room while you are taking a test and you do not know the answer to one of the questions, should you
1. Ask your nearest neighbor for help?
2. Look at your notebook in the desk?
3. Leave the question unanswered?

XII. If the person sitting nearest you in a test asks you for help and you give it to him when the teacher does not see you, do you think
1. That you are cheating?
2. That you are doing right as you are helping your neighbor?
3. That it is the other person's affair, not yours?

XIII. You lost your sneaks last week and today happened to see a pair in an unlocked locker. Should you
1. Take the sneaks with the intention of keeping them?
2. Take the sneaks from the locker thinking you might return them later?
3. Leave the sneaks and lock the locker?

XIV. Another pupil is blamed for something you did. Should you
1. Keep quiet unless you are questioned?
2. Tell the truth and thus take the blame?
3. Not tell the truth and let the other be punished?

XV. You had a headache and left school the last period in the afternoon without permission. Do you think
1. You were a truant?
2. As it was the last period, it would make no difference?
3. It was all right to go as you did not feel well?

TABLE I

NUMBER AND PERCENT OF CORRECT ANSWERS FOR EACH QUESTION

Questions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total	135	154	177	182	176	152	170	177	167	171	172	144	183	163	148
Percent Correct	72	82	95	97	94	81	91	95	89	92	92	77	98	87	79
Order of Standing	14	10	3	2	4	11	7	3	8	6	5	13	1	9	12

From Table I it is seen that of 186 pupils, 135 answered question 1 correctly, 154 answered question 2 correctly, etc. One hundred and eighty-three out of 186 gave the correct answer to question 13. Consequently, this question is rated 1. Question 1 was answered correctly by the least number, and stands 14th. Thus the remaining questions were rated.

It is interesting to notice that the four questions answered correctly by at least 95 percent of the pupils were those which deal with questions applying to actual problems which the pupils have encountered. These questions involve situations about which definite training has been given both at home and at school and there is little chance of more than one standard regarding them.

Several tentative conclusions may be drawn from the test:

1. That, in general, where it is a question of honesty, at least 90 percent know what the right action should be.

2. That children desire to maintain their standing with their fellows and will pretend to do that which they would not actually do, as shown by the fact that only about 40 percent would take the dare but 24 percent would pretend to take the dare but plan not to hit the light. (Data from question 1.)

3. Since 77 percent did not answer correctly question 12, regarding cheating, and since 23 percent checked the third statement which was "that it was the other person's affair, not yours," it may be concluded that this is quite the adult attitude, and to some extent reflects home influences.

4. That children very early form their conception of honesty on the basis of the specific situation is indicated by such statements as the following which were given in answer to question 6 involving the finding of the pocketbook, "It would depend on the amount of money it contained," "would return it if sure of a reward," "Lost and Found office is not always honest." The same is borne out by the answer to the question regarding cheating, "It is not real cheating unless I get something unearned for myself."

To determine whether or not the students who rate themselves higher on a paper and pencil test would act accordingly in an actual situation, a special study was made of the answers of forty individual pupils. Entirely unknown to the pupils, several papers in each group, forty in all, were selected by means of a code marking. Twenty of the forty were pupils who were known to have been flagrantly dishonest during the year and who were generally problem pupils; twenty were considered as the most exemplary pupils in leadership and conduct.

From the following table it is seen that the twenty superior pupils had 241 out of the 300 possibilities or 80 percent correct: the inferior pupils had 267 out of the 300 possibilities or 89 percent correct. This is en-

rely contrary to the supposition underlying such tests. The explanation lies in the fact that trustworthy pupils are the more honest in their

TABLE II

SUMMARY OF THE RESPONSES OF THE TWO GROUPS ON EACH QUESTION, AND THE TOTAL SCORE, IN NUMBER AND PERCENT OF CORRECT ANSWERS

Questions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	Av. Total
20 Superior — No. Correct	10	16	20	20	20	14	15	18	15	17	15	11	20	17	13	241	80%
Percentage Correct	50	80	100	100	100	70	75	90	75	85	75	55	100	85	65		
20 Inferior — No. Correct	17	15	18	20	18	18	19	19	17	19	18	16	18	18	17	267	89%
Percentage Correct	85	75	90	100	90	90	95	95	85	95	90	80	90	90	85		

answers and those who are naturally deceptive respond accordingly in a conscious attempt to deceive.

Table III shows a comparison of the number of questions answered correctly by superior and inferior pupils.

TABLE III

NUMBER OF QUESTIONS ANSWERED CORRECTLY	BY SUPERIOR PUPILS	BY INFERIOR PUPILS
15	3	6
14	4	8
13	5	4
12		
11	2	
10	3	1
9	1	
8	1	
7		
6	1	
3		1
MEDIAN SCORE	13.4	14.5

Table III shows that from the trustworthy group only three pupils answered the 15 questions correctly and of the dishonest group, six answered 15 questions correctly. Also we see that only one inferior pupil answered less than ten questions correctly while six superior pupils answered less than ten correctly. Two of the three lowest scores were those of pupils who are known to be the most exemplary children in the school. The dishonest pupils were careful to hide their real actions. The three pupils who are the most difficult problems, as to dishonesty and stealing, had 15 correct answers—a perfect score. A specific illustration is the fact that two of them owed money which they had borrowed some time before, but the fact that they knew that they should repay it, as shown by correct response on the test, did not mean that they intended to do it.

Table III and the brief resume of the case studies bear out the same conclusion: that the honest pupil is conscientious in answering the ques-

tions on such a test to the extent of rating himself so low as to invalidate the test. Similarly, the unscrupulous pupil attempts to cover up his dishonesty by rating himself so high that the test is likewise invalid for him.

The following conclusions may be drawn from these studies:

1. The great majority of children know what is right conduct as shown by their response on objective paper and pencil tests.

2. Honest children tend to rate themselves low on a paper test, dishonest children tend to attempt to conceal their dishonesty, and rate themselves high on such a test.

3. Knowledge of right conduct as measured by the tests does not guarantee a correct response in an actual situation.

4. There is need for the development of tests involving actual life situations. Such tests must be of such a character as to be possible of ready administration, and involve situations within the common experiences of children.

THE SPECIAL VOCABULARY OF CIVICS

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IT is almost axiomatic that a definite vocabulary outcome is desirable in the teaching of any subject, and especially is this true when a subject has a vocabulary more or less peculiar to it. But when a teacher searches for a word list, technical or otherwise, which he can use in attaining such an outcome, he discovers little to reward his efforts. The ten thousand words in Professor Edward L. Thorndike's *The Teacher's Word Book* are of great value for vocabulary purposes generally, but they do not solve the problem of the one who asks the question: What is the particular vocabulary outcome I can expect from the teaching of a special subject? There is nothing in the *Word Book* which will guide the teacher in making a selection of words and expressions often used in or which are more or less peculiar to any one of the social studies. The teacher cannot, therefore, depend upon the *Word Book* for developing the pupil's vocabulary however desirable that may be.

For several years the writer has faced the problem of attaining a definite vocabularly outcome in this social study or that. Semester after semester and year after year the old question has come up, especially in connection with civics: What shall I do for a list of words and expressions which I can use as a guide in my attempt to enlarge the vocabularies of the pupils in my classes? Everyone with whom the writer has talked about the matter agreed that such a list would have great value, that a study of it would help the pupils better to understand their assignments, and that the different words and expressions would enable them more fully to appreciate newspaper and magazine material having to do with topics discussed in the regular course of their work.

An analysis of textbooks on civics seemed to offer a solution of the problem. The vocabularies of a number of texts might be studied from which a list of words and expressions might be derived. To provide an adequate sampling of words it seemed necessary to search through several thousand pages of subject matter, reviewing a wide range of topics. The texts chosen for study are extensively used throughout the United States. The following books were chosen, though perhaps a slightly different choice would have answered quite as well:

Ashley, R. L. *The Practice of Citizenship.* New York: The Macmillan Company, 1923.

Dunn, R. V. *Community Civics for City Schools.* Boston: D. C. Heath and Company, 1921.

Garner, J. W. *Government in the United States.* Chicago: The American Book Company, 1922.

Harmon, R. V., Tucker, H. R. and Wrench, J. E. *American Citizenship Practice.* Chicago: The University Publishing Company, 1924.

Hepner, W. R. and Hepner, F. K. *The Good Citizen.* Boston: Houghton Mifflin Company, 1924.

Levis, E. C. *Citizenship: A Practical Text Book in Community Civics.* New York: Harcourt, Brace and Company, 1923.

Magruder, F. A. *American Government in 1925.* Boston: Allyn and Bacon, 1924.

Munro, W. B. and Ozanne, C. E. *Social Civics.* Chicago: The Macmillan Company, 1924.

Reed, T. H. *Form and Functions of American Government.* Yonkers-on-Hudson, New York: The World Book Company, 1923.

Woodburn, J. A. and Moran, T. F. *The Citizen and the Republic.* New York: Longmans, Green and Company, 1921.

In making a study of these texts the writer was assisted by several experienced high-school teachers and by more than forty seniors and graduate students in the University of Michigan, some sixty persons in all.

In order to appreciate the extent of the labor involved, and at the same time to enable those interested to judge of the value of the list given below, the successive steps followed in determining its make-up are described.

First a working list was prepared by selecting from the indices of the ten texts all the words and expressions with which, in the opinion of those making the study, the pupils should become familiar. Some of the words and expressions given below represent the choice of every one of those who collaborated in the work; some represent the choice of only one or two. After the first list was completed each text was searched by four different persons, additions being made to the original list as words or expressions were discovered which the searchers believed should be included. To this second list were added several words which twelve experienced teachers of civics had had frequent occasion to use in their own classes. The final alphabetical list was given to each of twenty seniors and graduate students in the University of Michigan, the individuals who assisted being chosen because of their expressed desire to have a share in the work. Each of these twenty students was assigned approximately one-half of one of the texts, and each searched through his particular allotment of material, reading line by line, and counting the number of times each word or expression appeared. Thus, in the

and, for each word and expression in the list, twenty separate frequencies were obtained. The sum of these frequencies represented the total number of times each word or expression appeared in all of the texts together.

The final step was taken for the purpose of determining the probable error in making the count. This was done by selecting at random twenty words and carefully counting the appearance of each in all of the books. The result of this recount, compared with the original count for the same twenty words, gave the approximate probable error for all of the words in the list. The count indicated that each was about fourteen percent too low. The arbitrary grouping given below has taken this error into account, words and expressions being moved to a higher group in each case where the addition of fourteen percent of the count warranted such a move.

In offering this list to social science teachers we do not claim that the number of times a word or expression appeared is an exact measure of its importance either in the subject of civics or in the vocabularies of the pupils. It seems, however, that some such grouping as has been made should be a rough measure of the importance of a word or expression in intelligent reading. If pupils use the above books either as texts or merely for purposes of reference they cannot read them understandingly unless they know the full meaning of the words and expressions found in them and, consequently, found in the list submitted herein. For complete comprehension, then, it is obvious that if a word appears on the average of about once, more or less, to every page of text material the pupil should know the various meanings of the word if he is to understand what he reads.

The judgment of the individual teachers who use this list will determine which words and expressions they will emphasize in their classes and how many of them they will attempt to have their pupils become familiar with. It is probable that many of the pupils in any one class in civics will already be familiar with a large number of the words and expressions in the list; but, on the other hand, it is equally probable that there will be many who will find it necessary by conscious effort to familiarize themselves with a large percent of them. The results of simple tests given at the beginning of a course compared with the results of tests given at the end of the course in which the words have been studied and used will enable a teacher to determine objectively what has been accomplished in the way of increasing the vocabularies of the pupils.

The numbers at the head of each group indicate that the words an expressions in that group had a frequency somewhere within the limit of these numbers.

2000 or more

city
government
law
people
state

1500-2000

congress
constitution
powers
public
school
United States

1000-1500

business
citizen
committee
community
country
county
courts
department
members
national
party
president
right
vote
war
work

500-1000

amendment
American
bill
board
buildings
candidate
case
convention
district
education
election
executive
federal
governor
group
health
home
House of Representatives
interest
judge
labor
legislature
local
money
nation
office
officers
official
organization
political
population
property
representative
senate
service
system
tax
voter

300-500

act
affairs
authority
ballot
bank
body
bureau
citizenship
civic
civil
commerce
commission
commissioner
corporation
council
democratic
duties
elect
family
foreign
improvement
individual
industry
institution
justice
legislation
legislative
majority
measure
plan
private
problem
rights
rules
secretary
senator
term
town
township
treaty
union
worker
world

200-300

activities
administration
America
appeal

appointment
appropriation
army

capital
charter
clerk
colony
company
cooperation
cost
crime
criminal

decision
democracy
disease

economic
employer
establish

factory
force

goods
govern

industrial
initiative

judicial

liberty

military

nomination
organize

peace
police
policy
popular
principle
privilege
profit
protect
protection
provision

rate
referendum
regulation
republican
revenue

session
social
society
Supreme Court

territory
trade
transportation
treasury

100-200

ability
administrative
agency
agriculture
appoint
area
articles
assembly
association
attorney

bond
branch
budget

cabinet
campaign
church
civil service
club
colonial
commercial
commission form of government
commodity
communication
competition
credit
customs

debt
delegate
dispute

efficiency
electors
employ
employee
employment
enact
enforce
enforcement
equal
expenditure

financial
freedom
function

governmental

highways
human

ideals
immigrant
immigration
income
independence
international

judgment
jury
jurisdiction

leadership
legal
levy
license

machine
mail
manager
market
material
militia
minority
modern
monopoly
movement
municipal

naval
navy
needs
neighborhood
nominate

obligation
occupation
offense
offender
order
owner

personal
petition
playground
primaries
principal
produce
production
progress
prohibition
promote
public opinion

qualification
question (public)

railway
recreation
regulate
report

representation
republic
responsibility
rural

salary
section
settlement
source
speaker
spirit
statute
strike
suffrage
superintendent
support

tariff
taxation
teamwork
training
treasurer

vice president
village

wealth
welfare

50-100

accused
administer
adult
agent
aliens
allegiance
amend
arbitration
arrest
Articles of Confederation
assess
auditor

belligerent
boss
boundaries

capitalist
caucus
census
charity
check
circuit court
city manager
civic center
civilization
collector
colonist
combination
compensation
compromise
comptroller
confederation
conference
congressman
conservation
conservative
constable
consular
contracts
conviction
currency

declaration
declare
defectives
defence
dependence
diplomatic
dispensary
divorce
domestic
draft

elective
electoral
engineer
enterprise
environment
equity
export

federalist
fee
finances
fine
foreigner

generation
grant

habits
housing

impeachment
import
inheritance
inspection
inspector
intelligent
internal
interstate
Interstate Commerce Commission
invention
investigate
investment

judiciary
justice of the peace

lawyer
League of Nations
leisure

marriage
mines
minister
Monroe Doctrine
motion (parliamentary)

native
naturalization
navigation
note

obey

pardon
parliament
patent
patriotism
pensions
plaintiff
platform
policeman
polls
post office
poverty
precinct
presidency
prevention
primary election
prison
promotion
prosperity
punish

quorum

race
ratification
ratify
recall
reform
registration
relationships
rent
reserves
resources
revolution

sanitary
savings
selection
sheriff
socialist
stocks

success
suit
supervisor
surroundings

tenements
thrift
ticket
title
town meeting
trust

unconstitutional
utilities

vocation

wants
ward
warrant
waste
will
witness

50 or less

abdicate
adjourn
aesthetic
alderman
alliance
allies
alms
almshouse
ambassador
Americanization
amnesty
anarchism
anarchy
annexation
anti-federalist
Appeals (Court of)
appointee
apportion
armistice
assemblage
assets
asylum
at large
attache
attainder
Australian ballot
autocratic
autonomy

bail
bailiff
balance of power
bicameral
Bill of Rights
bond issue
borough
boycott
bribe
bribery
broker
bureaucratic
burgess
Burgesses (House of)
by-law

calendar
capitol
capitation tax
chancery (Court)
checks and balances
circulation
city planning
civilized
clinic
closed shop
coinage
collateral
common carriers
common law
Commons (House of)
commonwealth
community center
commute
concurrent
conscription
consolidation
constabulary
consumption (of goods)
Continental Congress
copyright
coroner
cosmopolitan

deed
defendant
delegated power
delinquent
demagogue
dependency
depose
deputy
disposition
diplomacy
district attorney
division (of labor)
due process of law

elastic clause
electoral college
electorate
eligible
eligibility
emancipate
emancipation
embassy
emigrant
eminent domain
empanel
empire
employment bureau
enactment
endorse
enfranchise
enfranchisement
equality
ex post facto
exchange
excise
execute
exempt
expansion
expatriation
extension work
extradition
extraterritoriality

farm bureau
farm loan
federate
fellow citizen
felony
feudal
filibuster
floor leader
forester
fortification

gerrymander
gold standard
graft
grafter
Great Charter

habeas corpus
Hague Court
Hague Peace Conference
Hague Tribunal
Home rule
homestead
homesteader

illegal
illiteracy
illiterates
impeach
imperialism
inaugurate
indemnity

indeterminate sentence
indict
indictment
industrial revolution
injunction
inspire
intelligence
intention
intrastate
irrigation

juror
juvenile
juvenile court

labor union
law-making
legation
liability
libel
liberalism
lieutenant governor
lobby
lobbying
local option
lookout
log-rolling
loyal
loyalty
lynching

magistrate
Magna Charta
mandamus
marketing
marshall
martial law
mechanical
merchant marine
metropolis
militarism
minimum wage
misdemeanor
monarch
monarchy
mortgage
mothers pension
municipality

National Guard
nationalize
nominee
non-partisan
negligence
null and void

oligarchy
open door

pacifist
panel
parish
parole
partisan
partnership
party leader
passport
patriot
pauper
penitentiary
personal property
Petition of Right
playground director
plebescite
plutocracy
plutocrat
police power
policewoman
politician
poll tax
pool
posse
postmaster
postmaster general
postal service
postal system
prime minister
probate
probate court
proclamation
propaganda
proportional
prosecuting
prosecutor
punishable

quarantine

ratio
real estate
reciprocity
reclamation
recorder
reelect
reelection
repeal
residential
revision
right of eminent domain
ring

sanitation
sectionalism
sedition
sergeant at arms
single tax
social center
solicitor
sovereign
sovereignty
soviet
speculation
spoils system
statehood
statesman
suffragist
sweat shop

table
talesman
taxable taxpayer
territorial
toll
trade union
treason
treasure
tyranny

unemployment
unfair list
United Press
United Mine Workers
unrepresentative
urban

vacation
vagrancy
valid
valuation
venire
Versailles Treaty
vested
vise
vocational
vocational guidance
Volstead Act

Washington Conference
watcher
waterway
weather bureau
whip
woman suffrage
workman's compensation
writ

zone
zoning

HOW MUCH TIME IS REQUIRED IN THE FALL FOR PUPILS OF THE ELEMENTARY SCHOOL TO REACH AGAIN THE SPRING LEVEL OF ACHIEVEMENT?

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THE question of vital importance pertaining to the effect of vacations on the achievement of school pupils is not concerned with the absolute amounts of loss experienced by the pupils, but with the amount of time required for pupils to regain the knowledge and skills lost during the vacation period. Of the thirteen studies which have been reported which deal either wholly or in part with the effect of the summer vacation, only two have dealt with the amount of time required for pupils to regain the spring level of achievement. Kirby's study[1] was concerned with the effect of special practice in addition and division during the school year. The following fall he found that in addition about thirty minutes of practice were required to bring the group approximately to the efficiency which it had reached as a result of seventy-five minutes of drill during the preceding year. In division, "more than three-fifths as much practice was required to regain the standing reached in the experiment as was required at that time to reach it."

The writer's study[2] is concerned in part with the amount of time required under ordinary school conditions for pupils to reach again the spring level of achievement. Although the study contains data concerning a large number of school subjects, this phase of the study was limited to spelling and the fundamentals of arithmetic. The reason for limiting this phase of the study to these subjects was that in the other subjects, tests which would have sufficient discrimination and reliability and a sufficient number of duplicate forms could not be found.

The tests used were the Courtis Standard Research Arithmetic Tests, Series B, in grades 7B and 5A, and the Morrison-McCall Spelling Scale in grades 7B, 5A, and 3A. The first forms of these tests were given in

[1] Kirby, Thomas J. *Practice in the Case of School Children.* Teachers College, Columbia University Contributions to Education. No. 58, 1913.

[2] The complete study will be published as Bulletin No. 10 (1928) of the Bureau of Educational Research, the University of Wisconsin, Madison, Wisconsin, and is entitled, "The Differences in the Achievements of Elementary School Pupils Before and After the Summer Vacation."

May, 1926, just previous to the close of the school year. The second form was given in September of the same year, just following the opening day of school. Successive forms were administered at intervals of two weeks until six weeks had elapsed after the opening of school in the fall. Finally the tests were repeated just prior to the Christmas holidays, at which time approximately fifteen weeks had elapsed since the opening of school in the fall. The results are given in the accompanying table, in terms of the mean achievements of the pupils at the various testing periods.

	No. of Cases	Spring Mean	Fall Mean	First Retest Mean	Second Retest Mean	Third Retest Mean	Winter Mean
Arithmetic Attempts							
Grade 7B	49	45.1	44.6	43.4	45.2	50.6	53.3
Grade 5A	40	35.1	29.3	30.0	30.6	33.4	36.9
Arithmetic Rights							
Grade 7B	49	33.9	33.0	31.1	32.9	38.9	41.4
Grade 5A	40	25.3	19.1	19.4	20.5	22.7	25.6
Spelling Rights							
Grade 7B	49	39.6	39.4	39.8	39.1	39.8	40.2
Grade 5A	40	31.0	28.2	28.8	29.1	29.7	32.3
Grade 3A	44	23.4	20.1	21.3	21.6	23.9	25.0

Note: The figures underlined indicate the point at which the mean achievement for the group first equals or exceeds the mean for the spring.

One may easily question whether the tests are sufficiently reliable to enable one to draw conclusions from the results of tests given at such short intervals. While the differences in the means of successive tests are not statistically significant, it will be noted that in grades 3A and 5A there is a consistent increase in the mean achievement scores from the fall to the winter tests. This would probably indicate that the tests are fairly accurate measures, otherwise we might expect to find considerable fluctuation in the achievement scores. In grade 7B, where the losses over the summer vacation were very small, such fluctuation is found in the mean scores. The results for this grade could therefore scarcely be considered significant. The reliability coefficients which range from .85 to .92 when computed from the performance of pupils in a single half-grade, give further evidence concerning the reliability of the tests used.

Since grade 5A did not show the mean level of achievement found in the spring until the winter tests were given, it might have been well to have given additional retests in this grade after the six weeks' period in which the testing was done. However, since the increase was rather gradual for the period tested, one may infer from the relative size of the

mean of the third retest and the winter mean, about how much time was needed for the recovery. It was to be expected that grade 5A, which lost in achievement in the fundamentals of arithmetic during the summer vacation an amount equal to about the difference in the norms for two successive years, should take a longer time for recovery than was the case in grade 7B where the losses were, in the same subject, almost negligible. These data at best represent the condition in only one school system and the situation might be quite different in other school systems where a different course of study is used. No special drill was provided in these schools and the teachers were not aware that the successive tests were to be given. It is therefore probable that the situation was a fairly typical one.

According to the course of study followed in the schools tested, the grade designated as 7B received the following instruction in arithmetic during the fall semester: For the first six weeks, drill and review of denominate numbers; for the second six weeks, work on problems in percentage; for the third six weeks, work on problems in interest. The fact that much time is spent in this grade in drilling on the materials with which the Courtis tests are concerned, no doubt accounts in large measure for the large gains in arithmetic in this group. Less time is spent on these materials in grade 5A where the course of study calls for a two weeks' drill period on previously learned materials, a review of fractions and denominate numbers, work in mensuration, in decimals, and the multiplication and division of fractions. In spelling, all grades follow the procedure recommended by Horn and Ashbaugh but supplement the Horn-Ashbaugh word lists with words from the various grade assignments.

Another consideration is the practice effect upon the pupils of tests previously administered in this series. Since the pupils were already accustomed to taking tests of this character before this testing began, and since the tests were not identical in material but only in difficulty, it is probable that the practice effect would be very slight.

The results of this study may be summarized by saying that grade 7B had regained the spring level of achievement in speed in solving arithmetic problems involving only the fundamental processes, at the end of four weeks following the opening of school in the fall. In the number of problems solved correctly, they had again reached the spring average six weeks after the opening of school in the fall, and in spelling within two weeks. Grade 5A had regained the spring level of achievement some

time after the end of the six weeks' period and some time prior to the giving of the winter tests, in arithmetic attempts and rights and also in spelling rights. Grade 3A had regained the spring level of achievement in spelling by the end of the six weeks following the opening of school in the fall. It appears, from an analysis of the results of this investigation, that a review of the fundamental processes in arithmetic during the first month of each school year would yield large returns, in restoring the habits which have deteriorated through disuse. Where the deterioration is slight such review appears to increase the achievement far above the level attained during the previous school year.

EFFECT OF THE SUMMER VACATION ON THE ACHIEVEMENT OF PUPILS IN THE FOURTH, FIFTH AND SIXTH GRADES

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Do children lose in achievement during the summer vacation? Is it necessary that teachers spend time on review in the fall? Do all subjects require the same amount of review? These are some of the questions commonly asked by teachers and supervisors when school begins after the summer vacation. It is hoped that this study may throw a little light on the matter.

When school closes it becomes necessary to advise with parents and pupils in regard to attending summer school. Would it be advisable to send the children who are a little below norm or just on the borderline in June, to summer school? Again it is hoped that this study may help us.

Does the long vacation affect differently the children on different levels of intelligence? Objective data to answer this question would help exceedingly in educational guidance pertaining to the above mentioned situation.

In order to gather objective data the Stanford Achievement Test, Form A, was given to the fourth, fifth and sixth grades of the University Training School of the University of California at Los Angeles in May, 1927. In September of the same year the Stanford Achievement, Form B, was given to the same grades. All the tests were given and scored by the counselor. All figures were re-checked so possibility of error has been practically eliminated.

The loss or gain in all grades and all subjects is expressed in terms of the average amount of a school year above or below norm. Table I presents the results for the fourth grade in reading, arithmetic fundamentals, arithmetic reasoning, and spelling. In the spring these pupils took the primary form which does not include the other tests which are a part of the advanced form.

TABLE I

ACHIEVEMENT OF GRADE IV BEFORE AND AFTER VACATION

	No. of Cases	Reading	Arith. Fundamentals	Arith. Reasoning	Spelling
May, 1927	15	1.02	.70	.53	.12
Sept., 1927	15	1.08	.26	.43	— .13
Loss or Gain		+ .06	— .44	— .10	— .25

In reading the gain is so little that it may be considered negligible. In arithmetic fundamentals the loss is quite decided, almost half of a school year. In arithmetic reasoning the loss is much less, one school month, which may be due to loss in skill with the fundamentals. Again, in spelling we find quite a loss, two and one-half school months on the average.

Of the fifteen cases in this group, six lost in reading, six gained, and three remained constant. In arithmetic thirteen lost while only two gained. Nine lost in reasoning, five gained, one constant. In spelling eleven lost and four gained.

Table II presents the results for the fifth grade on both tests in all subjects.

TABLE II

ACHIEVEMENT OF GRADE V BEFORE AND AFTER VACATION

	No. of Cases	Reading	Arithmetic Fundamentals	Arithmetic Reasoning	Nature Study and Science	History and Literature	Language Usage	Spelling	Total
May 1927	26	.52	.60	.42	.03	.25	1.3	.02	.38
Sept., 1927	26	.58	.08	.35	.22	.03	1.23	— .30	.20
Loss or Gain		+ .06	— .52	— .07	+ .18	— .22	— .07	— .32	— .18

As in the fourth grade, the gain in reading in the fifth is so small that it may be considered negligible. In arithmetic fundamentals the loss is even greater than that of the fourth grade. In reasoning the loss is slight, hardly enough to be considered. In nature study and science there is a gain of one and eight-tenths months, while in history and literature there is a loss of a little more than two months. The loss in language usage is practically negligible. In spelling we have again considerable loss. The loss for the group on the composite score is one and eight-tenths school months.

In reading thirteen of the twenty-six cases lost, three remained the same and ten gained. Twenty-one lost in arithmetic fundamentals, three gained, and two remained constant. In reasoning twelve lost, nine gained, and five remained the same. In nature study and science ten lost, fifteen gained and one remained the same. Sixteen lost in history and literature and ten gained. Twelve cases lost in language usage, thirteen made a gain with one constant. There was a loss in spelling

for fifteen of the cases, a gain for seven, and a constant score for three. Sixteen of the twenty-six lost on the composite score, three gained and seven remained constant.

In Table III are presented the results of the sixth grade for both tests in all subjects.

TABLE III

ACHIEVEMENT OF GRADE VI BEFORE AND AFTER VACATION

	No. of Cases	Reading	Arithmetic Fundamentals	Arithmetic Reasoning	Nature Study and Science	History and Literature	Language Usage	Spelling	Total
May, 1927	28	.67	.99	.42	.27	.43	1.65	— .20	.39
Sept., 1927	28	.90	— .08	.38	.53	.13	1.10	— .50	.22
Loss or Gain		+ .23	— 1.07	— .04	+ .26	— .30	— .55	— .30	— .17

In this grade the gain exceeds that of the two preceding grades. It is possible that since these children are older they did more individual reading during the summer thus developing their ability to read. In arithmetic fundamentals the loss is exceedingly great. It is possible that they were given intensive drill before the close of school because they were almost a year above norm in the spring. If that was the case its value was greatly decreased by the long summer vacation. In arithmetic reasoning again the loss is too slight to be considered. In nature study and science there is here as in the fifth grade a gain, but a loss in history and literature. We find here too quite a decided loss in language usage as well as in spelling.

Of the twenty-eight cases nine lost in reading, seventeen gained and two remained the same. In arithmetic fundamentals twenty-two lost, three gained, and three remained the same. Fifteen lost in reasoning, ten gained, and three remained the same. In nature study and science eleven lost, fifteen gained, and two remained constant. Seventeen lost in history and literature, ten gained, and one remained the same. In language usage sixteen lost, ten gained and two remained the same. In spelling thirteen lost, ten made progress and five did not change. Eighteen of the cases lost on the composite score, eight gained and two remained constant.

Table IV shows the loss or gain during the summer vacation for each grade in each subject as well as the loss or gain for the whole group in reading, arithmetic fundamentals, arithmetic reasoning and spelling.

TABLE IV

CHANGE OF ACHIEVEMENT IN ALL GRADES AFTER VACATION

GRADE	NO. OF CASES	READING	ARITHMETIC FUNDAMENTALS	ARITHMETIC REASONING	NATURE STUDY AND SCIENCE	HISTORY AND LITERATURE	LANGUAGE USAGE	SPELLING	TOTAL
4	15	+ .06	— .44	— .10				— .25	
5	26	+ .06	— .52	— .07	+ .18	— .22	— .07	— .32	— .18
6	28	+ .23	— 1.07	— .04	+ .26	— .30	— .55	— .30	— .17
Total	69	+ .13	— .62	— .06				— .28	

All grades gained in reading ability during the summer vacation. In no class is there a decided gain. The summer vacation then is not detrimental to reading ability. In fact, almost half the cases gained in reading ability which in all probability is due to the fact that most children read for recreation and pleasure during the summer. In arithmetic computation there is in each class a decided loss. This is one of the so-called drill subjects. The average child probably has very little occasion to use much of the arithmetic on which he has been drilled, during his summer vacation. It takes constant practice to maintain a certain level in any skill. Since this is not done during the summer vacation there is bound to be a loss. It is possible that the drill that is given is not practical, that is, it is not what children actually use. That is a question for further investigation. In reasoning there is also a slight loss in each grade. This may possibly be due to the drop in skill of computation. All grades show a rather definite loss in spelling. Spelling is also one of the drill group so the loss here may again be due to the fact that in few cases do children receive any systematic drill or even much practice in spelling during the summer. Children as a rule do little writing during the summer. Both the fifth and sixth grades gained in nature study and science. It is possible that their general reading during the summer may be the cause for this. It would seem reasonable to assume that their general reading should lead to a gain in history and literature, also, but the reverse is true. Is it perhaps true that history facts are not retained as long or as easily as facts in regard to science? These are merely suppositions and can be substantiated only after much intensive investigation. In language usage both grades lost three months on the average. Perhaps they have associated with a different class of people or children during the summer, or perhaps they have just become careless because no one has checked up on them during the summer.

Table V gives the percentage of those with an IQ of 110 and above who gained or remained the same, and lost in reading, arithmetic computation, arithmetic reasoning and spelling. It gives the same for those who have an IQ of less than 110. In the higher IQ group are twenty-nine cases, in the other forty.

TABLE V

ACHIEVEMENT IN RELATION TO INTELLIGENCE

	Reading		Arithmetic Computation		Arithmetic Reasoning		Spelling	
	H.	L.	H.	L.	H.	L.	H.	L.
Constant or gained	.73	.50	.14	.22½	.46	.52½	.45	.42½
Lost	.27	.50	.86	.77½	.55	.47½	.55	.57½

In reading 73 percent of the high group gained or remained constant while only 50 percent of the lower group fall in this class. In both arithmetic computation and reasoning the lower group has the higher percentage of pupils gaining or remaining the same. The percentage in spelling is practically the same for both groups.

From these figures it would seem that the brighter children lost more than the average in arithmetic, both computation and reasoning. The loss in reasoning may be attributed to the loss in computation for it seems incredible that bright children should lose in problem solving ability during vacation. It seems natural that more of the brighter group should gain in reading for bright children, as a rule, spend much time reading, while other children read much less. However, these results should not be considered conclusive since they are based on too few cases.

In conclusion: First, do children lose in achievement during the summer vacation? The figures as presented in the preceding tables indicate that with this particular group at least the summer vacation had a decided detrimental effect on arithmetic computation, the total loss being six school months. In arithmetic reasoning the loss was negligible, only six-tenths of a school month. The effect on the reading ability is on the positive side. Hence the summer vacation is not detrimental to reading ability. The vacation has brought forth a loss in spelling, in language usage, and in history and literature. Slight gains appeared in nature study and science.

Second, is it necessary that teachers spend time in review in the fall? In the subjects which show a decided loss, principally arithmetic computation, some review would not be amiss. How much is necessary depends upon factors not considered here.

Third, should children be advised to attend summer school? If so, which one? Since most children lose in arithmetic and spelling and many of those in the lower IQ group in reading it seems advisable that those below norm or just above the borderline in the spring spend at least part of their vacation time in school or doing school work if they hope to keep up with their grade in the fall.

Fourth, is the effect the same on the bright child as on the average? In reading more of the bright children gain or remain the same, while in arithmetic, both computation and reasoning, more of the average children fall into that class.

These conclusions harmonize with the findings of others who have worked in this field. Patterson[1] found that the summer vacation was detrimental to arithmetic ability in all grades but had little effect on reading ability. Kramer[2] concluded that retention in arithmetic remains constant and improvement in reading will occur with the majority of the group. Elder[3] also found improvement in reading over a vacation period.

These studies, like our own, are incomplete in that the causes for loss or gain were not ascertained. Did those who gained go to summer school? What activities, if any, did these children engage in during the summer which called for exercise of reading and arithmetic abilities? If any, to what extent? Such information would help much in educational guidance.

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[1] Patterson, M. V. W. "The Effect of Summer Vacation on Children's Mental Ability and on Their Retention of Arithmetic and Reading," *Education*, XLVI (December, 1925), 222-228.

[2] Kramer, G. A. "Do Children Forget During Vacation?" *Baltimore Bulletin of Education*, VI (December, 1927), 56-60.

[3] Elder, H. E. "The Effect of Summer Vacation on Silent-Reading Ability in the Intermediate Grades," *Elementary School Journal*, XXVIII (March, 1927), 541-546.

MEASUREMENT OF THE EFFECT OF SCHOOL INSTRUCTION THROUGH CHANGES IN COMMUNITY PRACTICE

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EDUCATORS and laymen alike have always been more or less doubtful as to the extent to which school instruction affects the lives of those taught. That there is often great loss in the carry-over from the classroom to life outside the school is conceded. Some have urged that, if the measurement of the school's achievement is to be accurate, it must take place outside the school. Few have attempted to apply this standard.

A particularly good opportunity was afforded to do this when teachers of Vocational Agriculture in six small Central Iowa communities[1] attempted to determine the effect of their teachings regarding the growing of legumes upon the actual practices of their communities. It should be noted that this instruction had been given to some adults, as well as to members of high-school classes.

The growing of legume crops has long been recognized as a sound and profitable practice for this section. They are exceptionally high and sure yielders; their feeding value is far above that of other hay crops; they are valuable, in a way that other crops are not, in saving and in building soil fertility. Yet, for various reasons, the acreage of legumes in these communities had remained very small.

Four tests were made of the influence of the school upon legume acreages.

1. A comparison was made of the farms of those who had been reached personally with instruction or whose sons had been reached through the high-school classes in agriculture and those of persons who had received no direct assistance from the school. This revealed the situation shown in the first tabulation.[2]

[1] The communities studied were Bondurant, Gilbert, Jordan, Kelley, Newton and Waukee. The instructors coöperating were B. F. Clark, E. R. Stephenson, H. B. Swanson, A. A. Sather, L. V. Buckton, H. M. Byram, D. M. Hall, Homer Lucas and C. J. Hartman. The study was conceived and directed by Professor W. H. Lancelot, Head of the Department of Vocational Education, Iowa State College.

[2] The surveys of these communities reported in the first two tables were taken in 1926 and in 1927 and represent the most recent information we have regarding the situation.

Community	Percentage of Tillable Land in Legumes	
	Instructed Group	Uninstructed Group
Bondurant	13.9	2.7
Gilbert	19.0	11.2
Jordan	11.4	2.3
Kelley	12.7	7.6
Newton	10.7	8.8
Waukee	28.5	12.9

2. The percentage of land in legumes in each community was compared with that of the county in which it is located,[3] with the following result:

	Percent of Tillable Land in Legumes in Community	Percent of Tillable Land in Legumes in County
Bondurant	11.7	2.6
Gilbert	13.4	1.6
Jordan	6.1	1.8
Kelley	11.3	1.6
Newton	9.4	3.8
Waukee	18.7	2.7

So far as known, every agency or influence affecting legume acreage except the teaching of Vocational Agriculture has been operating as effectively throughout these counties as in the communities studied.

3. The first and last surveys of the legume situation which have been taken in these communities were compared:

	Percentage of Tillable Land in Legumes		
	Years Between Surveys	First Survey	Last Survey
Bondurant	2	4.5	11.7
Gilbert	1	7.6	13.4
Jordan	6	1.5	6.1
Kelley	3	6.4	11.3
Newton	3	5.1	9.4
Waukee	3	9.4	18.7

The average community had been teaching Vocational Agriculture in its schools for about two years before its first survey was taken. This probably accounts largely for the fact that even the first surveys of these communities revealed unusually large acreages of legumes.

4. The changes in legume acreages on the farms of 258 men who were included in two surveys were noted.[4] An average of 1.3 years had elapsed between these surveys.

	Percentage of Tillable Land in Legumes	
	Instructed Group	Uninstructed Group
First survey	11.0	6.7
Second survey	16.4	8.1
Increase	5.4	1.4

[3] Data regarding county averages are from the 1926 Yearbook of the Iowa State Department of Agriculture.

[4] One hundred seventy-four of these were the farms of those who had received instruction; 84 were farms of those who had not been reached by the schools.

Since even the "uninstructed" group increased its legume acreage while there was a slight decrease on the farms of the counties at large,[5] it is likely that considerable of this increase is due to carry-over of instruction from those reached directly by the school.

The survey data used in this study were secured from the farmers by the local teachers of Agriculture and the members of their classes. The facts were easy to secure. The data have been carefully checked by the writer, who believes that they are substantially correct. Where samplings were taken, they represented, on an average, more than half of the farms of these communities; checks on the sampling indicate that there was very little distortion of the facts by this process.

While not all of the conditions which make for the greatest accuracy were present in this study, they have led to the general conclusions that:

1. It is possible to measure, year by year, one of the important out-of-school results of the instruction in agriculture in our schools.

2. It is possible to determine, with some accuracy, not only the effect of teachings regarding the growing of legumes upon those directly instructed but upon others in a community who have been reached indirectly.

Payne and Schroeder have advocated a similar means of measuring the results of school instruction in health,[6] setting up such items as the following to be measured in the community at large:

1. The infant death rate.
2. The prevalence of special diseases.
3. The regularity of physical examination of children.
4. The percentage of children with physical defects.
5. Local sales of patent medicines.

Is it not possible that this method of measurement, which is much more genuine than those to which the school commonly resorts, may be used to a considerable extent in all of our school subjects? All that is needed is a clear-cut learning product of worth in real life and a means of determining when it has become a part of the routine life of the community.

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[5] Data from the Iowa Department of Agriculture for 1925-1926, the period most closely coinciding with that treated in this table, show that there was a slight decline in legume acreage in these counties in spite of increases in those communities teaching Vocational Agriculture.

[6] Payne, E. George and Schroeder, Louis C. *Health and Safety in the New Curriculum*, Chapter 16.

EDITORIALS

CONTRIBUTIONS AND CONTRIBUTORS

During the summer of 1927 I became curious concerning the extent to which the *Journal of Educational Research* was publishing articles in all the fields of education and the relative emphasis upon certain fields as compared with certain other magazines of national scope. I also wondered from what sections of the United States the contributions had been coming and with what types of institutions the writers were associated. In consequence of these wonderings, I set a graduate student[1] to work analyzing the contents of Volumes VI to XV (June 1922-May 1927 inclusive) of the *Journal of Educational Research* and corresponding volumes of *Educational Administration and Supervision, School Review,* and the *Elementary School Journal.* These journals were chosen as national in character and having a reading clientele somewhat similar to that of the *Journal of Educational Research,* namely — college people, superintendents, principals, supervisors, and teachers.

It was found that the total number of articles in the four magazines for the five years was 1216, distributed as follows: *Elementary School Journal,* 267; *Educational Administration and Supervision,* 304; *School Review,* 320; *Journal of Educational Research,* 325. This means that our *Journal* published 26.7 percent of all the articles published by the four magazines during this five-year period.

These articles were classified under seven general heads and the percentage of articles under each classification published by each magazine was computed. These results are given in Table I, which is read as follows: There were 410 articles of an administrative character published in the four magazines. Of these the *Elementary School Journal* published 19 percent, *Educational Administration and Supervision* 42 percent, *School Review* 15 percent, and *Journal of Educational Research* 24 percent. The figures in the other columns are read in the same manner.

[1] Full credit for the information contained herein is given to Mr. A. B. Weiser, superintendent of schools in Canal Winchester, Ohio, who made the study under my direction.

TABLE I

PERCENTAGE DISTRIBUTION OF ARTICLES AMONG SEVEN GENERAL TOPICS AND AMONG FOUR MAGAZINES

	Administration	Curriculum	Educational Tests	Intelligence Tests	Other Tests	Statistics	Miscellaneous
Total Number of Articles	410	440	45	64	13	42	202
	PERCENTAGES						
Elementary School Journal	19	34	16	11	8	7	13
Ed. Ad. & Sup.	42	13	9	19	8	12	26
School Review	15	30	24	11	38	7	48
Journal of Ed. Research	24	23	51	59	46	74	13

From this table it is seen that the *Journal of Educational Research* published almost its quota in the fields of Administration and Curriculum and much above its share in all three test fields and in statistics.

A further analysis of the articles revealed that 75 percent of all the articles under consideration could be classified under the following seven headings: teachers, curriculum materials, learning, general administration, miscellaneous applied to high schools, curriculum building and child accounting. Under these headings, the *Journal of Educational Research* published its share or more of the articles in learning, curriculum building and child accounting.

A second question considered was the geographic distribution of the writers of these articles. Table II gives this distribution for each of the magazines, and is read as follows: Of the 267 articles published in the *Elementary School Journal* during this period, 5 percent were contributed by writers from the New England states, 12 percent from the Middle Atlantic states, 47 percent from the East North Central states, and so on. The figures for the other journals and for totals are read in the same manner.

TABLE II

GEOGRAPHICAL DISTRIBUTION OF THE WRITERS OF THE ARTICLES IN THIS STUDY

	JOURNALS				
Total No. Articles	E.S.J. 267	E.A.&S. 304	S.R. 320	J.E.R. 325	Total 1216
SECTIONS	PERCENTAGES				
New England	5	5	5	3	5
Middle Atlantic	12	25	13	20	18
East No. Central	47	27	42	36	38
West No. Central	14	13	16	16	15
South Atlantic	2	5	7	2	4
East So. Central	2	4	1	2	2
West So. Central	4	4	3	1	3
Mountain	4	7	2	5	5
Pacific	9	10	11	12	10
Foreign	1	1	0	2	1

From this table it is seen that our *Journal* compares favorably with these others. Every part of the United States is represented though the South and New England less well than other sections of the country.

Table III presents the distribution of the articles contributed from each geographical section among the four journals. It is read as follows: Of the 57 articles contributed to the four journals by writers in the New England states, 23 percent were published by the *Elementary School Journal*, 28 percent by *Educational Administration and Supervision*, 30 percent by *School Review*, and 19 percent by the *Journal of Educational Research*. The other figures are read in the same manner.

TABLE III

DISTRIBUTION AMONG THE FOUR JOURNALS OF ARTICLES CONTRIBUTED BY WRITERS IN THE VARIOUS GEOGRAPHICAL SECTIONS

SECTIONS	Total Articles	PERCENTAGES IN			
		E.S.J.	E.A.&S.	S.R.	J.E.R.
New England	57	23	28	30	19
Middle Atlantic	213	15	35	19	31
East No. Central	459	27	18	29	26
West No. Central	179	21	22	28	29
So. Atlantic	47	10	30	45	15
East So. Central	27	22	44	15	19
West So. Central	38	29	34	26	11
Mountain	56	21	37	13	29
Pacific	127	18	24	27	31
Foreign	13	15	23	0	62

This table shows that the *Journal of Educational Research* secured its full share of the articles that were published in the four magazines from all sections except the South and New England. Eight of the 13 articles by foreign writers appeared in our *Journal*.

When the writers of these articles were classified according to type of position held it was found that 91 percent of all the articles were written by men in the ten positions named in Table IV, which is read as follows:

TABLE IV

PERCENTAGE DISTRIBUTION OF ARTICLES BY TYPE OF POSITION HELD BY THE AUTHOR

TYPE OF POSITION	Percent of all Articles	Percent of Articles Published in J.E.R.	Percent Articles Published in J.E.R. is of Total from This Type of Position
In Endowed University	24	33	37
In State University	22	20	25
City H. S. Teacher	12	6	12
Supt'cy City Schools	9	8	24
In State Normal	6	2	11
In Liberal Arts College	6	5	25
In City Elementary School	5	4	23
In Teachers College	4	5	28
City Director of Research	2	5	54
Ass't State Superintendent	2	1	16

24 percent of all the articles in this study were contributed by persons holding positions in endowed universities, 33 percent of the articles published in the *Journal of Educational Research* were contributed by persons holding positions in endowed universities; those published by the *Journal of Educational Research* were 37 percent of the total number contributed by persons holding such positions. The other figures are read in the same manner.

All these data show conclusively that the *Journal* during these five years had wide interests, though specializing more than these other magazines in the fields of tests and statistics. They also show that persons in every part of the United States and in foreign countries, and persons holding a great variety of educational positions considered it a good medium for publication. Such data seem to justify the conclusion that the *Journal* has a definite position to maintain and a definite contribution to make in the field of education.

E. J. A.

REVIEWS

Address all communications relative to book reviews to Editor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

PAULU, E. M. *Differentiated Assignments in Classroom Management*, New York, D. C. Heath and Company, 1928.

Dr. Paulu has attempted, through a student's Exercise Book, an objective test to provide for individual differences in college students in college work in classroom management. Specific problems are set up for each day, numerous references are given, and objective tests are provided to check on the achievement of members of the class. The series presents additional evidence that gradually college teachers are beginning to recognize what has been known for some time in elementary schools, namely, that students differ in ability and should receive different treatment.

JUDD, CHARLES HUBBARD, *The Unique Character of American Secondary Education*, Cambridge, Harvard University Press, 1928. 63 pages.

In the Inglis Lecture for 1928 Professor Judd vigorously defends the American public secondary school against the attacks of those critics who would have us believe that our secondary schools are inefficient and that our salvation lies in reverting to European practice. The American high school is an experiment in human adaptation, an experiment which cannot be abandoned because not only in America but in other countries as well human nature is seeking access to higher education. Evidence is cited to show that in England, France, Germany, and Sweden strong popular demands are being made for secondary schools that will be freer than the caste-bound institutions of the past.

Our American high schools are unique in five respects. The first characteristic is their accessibility evidenced by the fact that the doors of the schools are open to all boys and girls who are properly qualified to enter. No system of competitive examinations bars countless thousands from entering; nor does fear of overcrowding certain socially desirable occupations cause ruthless elimination of many who are permitted to enter.

In the second place our public secondary schools are characterized by their flexibility, a flexibility which is the natural result of our mobile society. A narrow, rigid curriculum cannot serve the needs of four million boys and girls representing every occupational class and aspiring to hundreds of walks in life. In order to meet the demand for flexibility we have developed the cosmopolitan high school and the elective system. Professor Judd shows that, contrary to the statements of some of its critics, the high school with its elective system can maintain a coherence in school studies—a coherence "which results not from dull repetition but from an apprehension of the fact that genuine learning aids the individual to adapt himself to his social obligations."

The third unique characteristic of the American secondary school is its huge

size. Its phenomenally rapid development has made it impossible to secure competent teachers in adequate numbers, and has raised the question of continued financial support. These problems must be faced and solved not by a policy of limiting the pupil population but by a policy of expansion.

In the fourth place our high schools are characterized by a pupil spirit that is different from that in European schools. In Europe attendance in a secondary school is a high privilege; in America it is accepted as a matter of course. To counteract the lack of seriousness on the part of American pupils Professor Judd advocates direct instruction in the meaning and value of American opportunities.

A final characteristic of American secondary schools is their local control. In no European country is this true. This local control has been kept from going to extremes by the regulations of various voluntary standardizing agencies, and by our scientifically established educational principles.

The closing pages of Professor Judd's lecture are devoted to a fine tribute to Alexander Inglis who was an expansionist in his conception of secondary education.

The Unique Character of American Secondary Education should be read by every high-school teacher and administrator. To read it is to strengthen one's faith in our attempts to provide secondary education for all American boys and girls.

D. H. EIKENBERRY
Ohio State University

GOOD, CARTER V. *How to Do Research in Education*, Baltimore, Warwick and York, 1928.

One significant indication of professional growth in a field of endeavor is the development of general interest in research within the field. Considerable progress in this direction has evidently been made in the field of education, if the number of important contributions to the literature on the purposes, methods, and results of educational research within the last four or five years, are any indication. Among the treatments which have gone somewhat beyond the consideration of mere general principles are McCall's *How to Experiment in Education*, Trow's *Scientific Method in Education*, and Good's *How to Do Research in Education*. This last is the most recent and undoubtedly the most complete summary of the problems of educational research in general.

It is doubtful if the experienced research worker, or the advanced research student in education, will find a great deal that is entirely new in concepts of research as presented in this book. He will find, however, that it does present a carefully selected and critically evaluated summary of the purposes of research in education, the best methods of procedure, and the generally accepted forms of presentation, as gleaned from the works of recognized technicians in the educational field. This insures its value to the experienced worker, and makes it doubly valuable to the student in training. In his discussion of such points as the selection and statement of research problems, the methods of controlling variables, the responsibility of the student for the accurate reporting of educational research, and the need for a broad background for the understanding of the problem by the student, the author has crystallized what is in the minds of every worker in education responsible for the direction of the research activities of students for advanced degrees.

Fortunately, the author has not at-

tempted to show by flat statements exactly what is implied by the somewhat direct title of the book. The fact that the volume recapitulates and summarizes so much of the more or less unorganized thought on research methods makes it particularly valuable to those interested in training students in research methods. It makes it possible to more definitely place the responsibility for these phases of his training on the student himself.

It is this reader's impression that in presenting this volume the author has rendered a real service to at least three types of persons interested in educational research, viz., (1) the experienced research worker, through its emphasis on the scientific attitude; (2) the professor of education responsible for the direction of graduate research and the training of students in its elements, through its clearcut statements and summaries of research methods; (3) the graduate student in education, through its crystallization of the best accepted principles and practices in educational research. Finally, it is probably not without value to the layman and to the critic of education because of the straightforward manner in which the scientific method in education is exemplified.

H. A. GREENE

University of Iowa

GARRISON, NOBLE LEE. *Status and Work of the Training Supervisor.* New York, Bureau of Publications, Teachers College, Columbia University, 1927. vii + 98 pp. (Teachers College, Columbia University, Contributions to Education, No. 280).

What is the present status and work of the training supervisor (critic teacher) in our teachers colleges? What procedures will aid in making the work of the training supervisor more effective in eliminating the present "double track" system of training? These are significant problems which Mr. Garrison attempts to solve in this very thorough study. His data were secured by means of a very extensive questionnaire dealing with every phase of the work of the training supervisor. Replies were received from 433 teachers in 55 institutions located in 30 states.

The investigation reveals the fact that critic teachers are fairly well-trained and well-qualified group. The following data support this conclusion:

(1) About 75 percent hold at least the Bachelor's degree.
(2) About 25 percent hold the Master's degree.
(3) The average supervisor has had 12 years and 11 months experience as a teacher, supervisor or principal, and has been in her present position for 3 years and four months.
(4) She makes conscientious and systematic efforts to improve her work.
(5) She has a fine professional attitude.

There are many reasons why the work of the training supervisor is not more effective. Among them are:

(1) She carries too heavy a load of student teachers (far above the maximum set by the American Association of Teachers Colleges.)
(2) She does not have time for routine work, conferences, etc.
(3) She is not adequately supervised.
(4) No systematic attempt is made to keep her informed of the work being done in theory courses.
(5) She is not given proper recognition with respect to rank, salary, and participation in policies.

The author makes two important recommendations. First, "some qualified person should be put in charge of, and held responsible for, developing and maintaining proper coördination of work with each of the main curricular groups,

such as Rural Education, Elementary Education, etc." This would remedy many of the present defects of the "double track" system of training. Second, upon meeting certain standards, training supervisors should be given the same ranking titles, privileges, and salary that are now accorded the college staff.

This study, while it is subject to the usual limitations of the "questionnaire method," should prove exceedingly suggestive to all who are charged with the responsibility of training teachers. It calls attention to some glaring defects in current procedures and points the way to a constructive program of betterment.

H. B. ALBERTY
Ohio State University

HAWKES, HERBERT E. *College—What's the Use?* New York, Doubleday, Page & Company, 1927, 143 pp.

During the last decade while students in ever increasing numbers have been crowding into our institutions of higher education, numerous magazine articles have appeared upon the subject. A careful examination of the sources of these articles will reveal the fact that a large majority of them have been written by faculty members who have been annoyed by enlarged classes or disciplinary problems on the campus and by public school men whose philosophy of education includes an opportunity for higher education for all those who wish it. All too seldom do we find a discussion written by one who speaks from an intimate intellectual acquaintance with the problems of higher education and at the same time with an evident focus of attention on the well-being of the youth.

Dean Hawkes in this little volume combines in a most admirable way a clear statement of the problems which both young people and colleges are facing, but throughout it all maintains the point of view that the youth is the first consideration and that the solution to the problem is not solely one of having everybody in college or of selecting only those who measure up to the traditional type. The book can be read with profit by every student and college man who is willing to be honestly critical of himself and of his established ideas. Each will understand better the obligation that college life imposes upon him. The problems treated are vital, the issues are set forth clearly and it is all written in a style so charming that one finds himself reading it for the enjoyment of the style quite as much as for the content.

E. J. ASHBAUGH
Ohio State University

FINNEY, ROSS L. A *Sociological Philosophy of Education*, New York, The Macmillan Co., 1928. vii + 563 pp.

In no other age, and probably in no other contemporary society, has education been so subjected to critical discussion, scientific investigation, and random experimentation as in the United States during the past generation. The inevitable result is the undermining of past faiths, a series of educational crusades, and the kaleidoscopic rise and fall of pedagogical fads. Crusaders and faddists naturally rush into print. The net result of this publicity is a partial eclipse of the work of careful experimenters and the befuddling of the minds of poorly grounded teachers and of the general public. It is obvious that in our newly aroused zeal for a more scientific scheme of education we have lost perspective. Our natural difficulties in seeing straight and as a whole through the maze of new movements has been enhanced by an excessive differentiation of

professional courses in schools of education and our loss of interest in historical and philosophical studies of educational functions, systems, and processes.

Under such conditions the sober educator should welcome, and there are many evidences that he does welcome, such incursions into the philosophy of education as the recent volumes of professor Bode and this book by Professor Finney. If we are to shorten the arc of the pendulum swing in pedagogical theories and practices, and keep school work focused upon the heart of youthful human nature, we must pay the price of reading and assimilating wholesome criticism.

In his *Sociological Philosophy of Education*, Dr. Finney has brought into requisition two invaluable assets, a penetrating sociological viewpoint, and a scintillating English style. Whether or not one agrees with his conclusions, and there are many with which the writer cannot agree, his treatment of each of his themes is lucid and entertaining. His attack is daring and direct, his analyses keen and well illustrated, and, if his philosophy of education is too impressionistic to be complete, it is at all points stimulating and helpful. His challenge to the worshiper of minute objective studies is particularly worthy of note, as is also, his fear of the over-technical preparation of teachers.

No one of the seventeen chapters is either dull or valueless, but of particular significance is his treatment of the social nature of the mental life, his continuous insistence upon greater recognition of the fine arts in our school curricula, and upon the basic value of a general knowledge of the social sciences as a stablizer of civic and institutional life. The value of the book for textbook use is limited by its lack of suggestive questions and problems, by the absence of bibliographies and by its lack of completeness in organization and concreteness of treatment. While best adapted to general reading it should, nevertheless, find its way into many educational classrooms, and serve as an antidote to some of our mechanistic educational vagaries.

WALTER R. SMITH
University of Kansas

MEYER, JACOB G. *Small Colleges and Teacher Training*, Bloomington, Ill., Public School Publishing Company, 1928. 162 pp.

There has never been a greater interest than exists today in the subject of teacher training. One of the most important and fundamental questions connected with this subject is that of the part which the liberal arts college shall have in the teacher training program. The book, "Small Colleges and Teacher Training," reports an interesting study of the extent to which liberal arts colleges, and especially the smaller ones, are engaging in this activity. A strong argument is presented favoring a much larger participation by the small liberal arts colleges in the teacher training work. This argument is based upon studies of supply and demand for trained teachers covering several states, and upon the author's proposition that the small college is for all practical purposes a public institution.

In the latter part of the book the author endeavors to answer the question: "Should the liberal arts college train teachers?" In this portion of the book the author seems to be guilty of permitting his own prejudices to lead him to some unjustifiable conclusions. He is not satisfied with demonstrating that state supported teachers colleges have not been able to provide an adequate supply of trained teachers, and that

therefore the small liberal arts colleges must supplement the efforts of these institutions. He endeavors to lead the reader to believe that the faculties of the teachers colleges are inferior to those of the small liberal arts colleges. In the absence of more convincing evidence than is presented it would have been much better to have omitted this part of the argument.

Perhaps the most valuable contribution which this book makes is contained in the author's recommendations at the end of the last chapter. He suggests that the work of teacher training in liberal arts colleges should generally be confined to the preparation of high-school teachers, that departments of education in liberal arts colleges should not be satisfied with meeting minimum state requirements, and that liberal arts colleges aiming to prepare teachers should organize departments or schools of education staffed by a teaching force whose training and teaching ability would be equal to that of the best faculty members in the state teacher training institutions. He failed to give consideration to what is perhaps the most serious difficulty confronting the liberal arts college which desires to train teachers, that of securing and financing adequate facilities for observation and student teaching. Finally, the author spoiled what would have been an excellent conclusion by the statement that the tendency of the normal schools to become teachers colleges should be discouraged.

ALONZO F. MYERS
Ohio University

MACKANESS, GEORGE. *Inspirational Teaching, A Record of Experimental Work in the Teaching of English*, New York, E. P. Dutton and Company, 1928. xi + 225 pp.

This book is out of place in the present gallery; as Mr. Mackie notes in the Foreword, "These accounts of teaching procedure require the support of tests of the attainments produced by various forms of scholastic treatment," and no such tests have been given. The only professedly tabular presentation of data is two lists of the numbers of boys who read various books from a list of the teacher's own choice, under "no actual compulsion other than constant supervision, selection and encouragement," and the imminence of various examinations, to spur the boys on. This adds nothing important to previous studies of children's interests.

Nevertheless, the book is a good, stimulating account of procedures similar to those of Mr. Caldwell Cook (H. Caldwell Cook, *The Play Way*. Stokes) living and pleasant accounts of "Magimaps," playmaking, good beginnings of work in composition, and verse-writing. The author regrets that there are in Australia no such forward-looking and helpful agencies for teachers of English as the English Council and the *English Journal*. American teachers extend to their colleagues their best wishes for the beginning of such an important organization and for the intelligent inauguration of scientific studies such as the *Journal of Educational Research* represents.

S. A. LEONARD
University of Wisconsin

SWAIN, MIRIAM MASON. *Fairy Folk Stories and Pictures*, Chicago, Hall & McCreary Company, 1928. 32 pp.

This booklet contains a story to be read or told by the teacher to the children and then sections of the story produced with a picture to be colored. The accuracy with which the child is able to color in accordance with the story gives some measure of the degree of comprehension with which the child is able to read.

RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to Editor A. S. Barr, University of Wisconsin, Madison, Wisconsin.

DOUGHERTY, MARY LORETTE. "A Comparative Study of Nine Group Tests of Intelligence for Primary Grades," *Johns Hopkins University Studies in Education*, No. 10. Baltimore, The Johns Hopkins Press, 1928.

This is a study of the validation of intelligence tests. The name of the tests included in this study, with the grades in which they were used follows:

TESTS	KINDERGARTEN	FIRST GRADE	SECOND GRADE	THIRD GRADE
Cole-Vincent	x	x		
Dearborn	x	x	x	x
Detroit		x		
Haggerty		x	x	x
Kingsbury		x	x	x
Myers		x	x	x
Otis		x	x	x
Pintner-Cunningham	x	x	x	
Pressey		x	x	

Approximately 200 cases were secured for each grade. The schools used were selected so as to get a racially and socially representative group of white pupils in the schools of the city of Baltimore. The number of pupils selected for each grade was determined on the basis of the proportional number of each age in that grade. Thus in the first grade 42 percent or 84 pupils were six year olds, 46 percent or 92 pupils were seven year olds, and 12 percent or 24 pupils were eight year olds.

Two criteria were used in evaluating the tests: Stanford Binet IQ's and the average IQ's for all the tests given to each grade.

The specific questions answered for each grade or group were: "Which test will give the best measure of individual pupils? Which test or pairs of tests will rank the pupils nearest to the ranking they would have if they were given the Stanford-Binet? Which test will rank the pupil nearest to that of the average of the whole number of tests?"

The study was repeated the second year but with no material change in the results.

The following table gives the ranking of tests by a composite of the rankings by both criteria for the first and second years.

TEST	KINDERGARTEN	FIRST GRADE	SECOND GRADE	THIRD GRADE
Cole Vincent	M	M−		
Dearborn	L	M+	M	M+
Detroit		L		
Haggerty		L	L	M
Kingsbury		M	H	M+
Myers		M−	H	M+
Otis		H	M+	H
Pintner-Cunningham		H	H	
Pressey		M+	M−	

This table should be read. Cole-Vincent test, when ranked by the composite ranking, ranks middle in the kindergarten and below middle in the first grade. The other letters are M+ for above middle, L for low and H for high.

GARLIN, R. E. "Factors Conditioning the Success of School Surveys," *School and Society*, XXVIII, September 15, 1928.

The purpose of this article is to set forth the factors which have contributed to the success of school surveys and those which have presented obstacles to success. Emphasis is given those factors which can be controlled by proper and adequate school publicity. The data were collected by means of several inquiry forms and represent the survey publicity experiences of twenty-one states and forty-eight cities.

The factor mentioned most frequently as contributing to the success of state surveys was the support of the newspapers. For cities, the most important factor was support of the board of education, although this ranked only slightly higher than support of the press. Important factors of success for both cities and states are the following: securing the support of leading citizens, making the school needs evident, securing the leadership of the teachers, making reasonable the recommendations for the improvement of school conditions, employing an outside survey staff, preventing delay in the survey, presenting actual facts of school conditions, placing copies of the survey report in the hands of leaders, employing a survey staff with a "save" view of school conditions and problems, and giving adequate publicity to the findings of school surveys.

The greatest obstacle encountered by the states was that of reaction against taxes; by the cities, a lack of funds for publicity. Other significant obstacles are: it takes time to reap the benefits of a survey, a lack of organized publicity, the increased cost of education, a lack of public interest, politics, conservatism and backwardness of the people.

The writer recommends that:

1. Survey publicity be made adequate.
2. Survey publicity efforts be thoroughly organized through committees.
3. The support of the intelligent leaders in the community be listed through clubs, organizations and board members. The support of the press is most valuable.
4. Publication of the survey report be very prompt so that the early enthusiasm may not be lost.
5. There be harmony and coöperation on the part of the state departments of education, county superintendents and the survey staff.

MONROE, WALTER S., *et al.* "Ten Years of Educational Research, 1918-1927," *University of Illinois Bulletin*, Bureau of Educational Research, College of Education, University of Illinois, 1928. 367 pp.

A comprehensive survey of the development of educational research with particular reference to the period, 1918-1927. Part one of the bulletin contains an introduction and chapters on Educational Research before 1918; a General Survey of the Period, 1918-1927; Research in Educational Measurements; and Curriculum Construction. Part two contains an introduction, a list of Educational Researches and Research materials, a topical index for the above list and a list of Doctors of Philosophy in Education by Institutions. The list of researches contain all together 3650 titles. The bulletin is an excellent contribution to the literature of Educational Research and an invaluable hand book for research workers.

"Practices Affecting Teacher Personnel," *Research Bulletin of the National Education Association*, VI, September, 1928.

This bulletin, which is based upon data secured from 1532 usable replies to a questionnaire directed to cities over 2500 in population, presents material relative to a number of practical problems concerned with the management of teaching personnel, such as, salary scheduling, requirements affecting appointment, retention and promotions, training requirements for beginning teachers, married women as teachers, practices affecting professional improvement, leaves of absence for study and travel, recognition of additional training, sick leave, relation of salaries to efficiency, efficiency ratings, salaries of men and women teachers, etc. The discussion is amply supported by statistical data.

SIEBERT, HANS. "A Study of the Interests of Pupils Based upon Pupil's Questions", (Beitrag zur Bestimmung der Interessen-richtungen von Schulern auf Grund von Schuelerfragen.) *Archiv fuer die gesamte Psychologie, lxiv, I und II. Heft, 1928, 93-124.*

The author collected 12,014 questions from 6419 pupils of elementary and secondary school level. The ages of these pupils ranged from 8-18 years. All grades (both sexes) from the second through the thirteenth of the gymnasia were included. The questions were the free questions of pupils prompted by the class discussion. Each question was written on a slip of paper and placed in a closed box exposed in each classroom during the recitation period.

These questions were then classified in several ways: 1. With reference to the object to which the question is referred; 2. With reference to school subjects; 3. With reference to the age of the pupils; 4. With reference to types of schools which the pupils attended; and, 5. With reference to the sex of the pupils.

Some of the findings with regard to classification schemes number 1 and number 2 are here given. The greatest number of questions asked were found under the heading "nature", (28.2 percent for the elementary schools pupils, and 29.5 percent for the secondary school pupils). "Self" (21 percent and 14.8 percent respectively), and interests for "human products", "personalities", "fatherland", and the "school", (9.9 percent and 15.6 percent, respectively). There was very little interest in the "sciences" "foreign countries", "and the community in general." Regarding classification number 2, about 40 percent of the elementary and 43.8 percent of the secondary school pupils ask questions outside of the school curricula. The interest in geography and natural sciences was greatest for pupils of all types of schools (45.6 percent and 38.3 percent) respectively. Medium interest was found in history, German, religion, gymnastics and sport (12.6 percent and 16 percent) respectively. Mathematics, Latin, Greek, French, English; and all technical subjects showed only a minimal interest (.4 percent and 1.5 percent).

STETSON, F. L. AND HUFFAKER, C. L. "Pupil Counseling in Grades Seven to Twelve," *University of Oregon Publication*, 1928.

A discussion of pupil counseling in grades seven to twelve as follows: The development of guidance, the need for guidance, the meaning of counseling, the organization of a counseling program, procedures in counseling, etc.

WURZINGER, STEPHAN. "Types of Habitus and Development of Body during the School Age. Study on 510

Elementary School Pupils of the City of Munich'' (Habitustypen und Koerperentwicklung im Schulalter nach Studien an 510 Muenchner Volksschuelern. *Anthropol. Inst. Univ. Muenchen. Zeitschrift fuer die gesamte Anatomie, Abt. 2: Zeitschrift fuer Konstitutionslehre, Bd. 13, H. 6, S. (1928) 715-778.*

Five hundred and ten pupils from 6-12 years of age were anthropometrically measured and the results statistically computed. Some of the more important findings are cited below. There are two specific forms of habitus-types among these children. The leptosomatic type occurred in about 20 percent, the eurysomatic 37 percent of the children. The rest of the 43 percent of the children belonged to the mixed type. Mental workers tend to have children of the leptosomatic type; where the parents are of the hand working class the children have eurysomatic habitus.

EXPERIMENTAL STUDIES REPORTED IN CURRENT ISSUES OF OTHER MAGAZINES

EDUCATIONAL ADMINISTRATION AND SUPERVISION

REAVIS, W. C., and WOELLNER, ROBERT. "The Time and The Personnel Available for Administrative Duties in Secondary Schools," *The School Review*, xxxvi, (October, 1928), 576-592.

The data presented in this article were gathered by means of a check list from 522 secondary-school principals who were members of the National Association of Secondary School Principals in 1927. The discussion is supported by a number of tables that should prove helpful to principals who are interested in analyzing administrative practice in schools of different types.

PSYCHOLOGY OF LEARNING

"Methods of Subtraction", *Public School Messenger*. Published by the Department of Instruction, St. Louis Public Schools, XXVI, (September, 1928), 28-32.

A study of the frequency with which the borrowing, take-away equal additions, and the additive or Austrian methods were used among 1065 St. Louis elementary-school pupils. Three hundred and twenty used the take-away equal additions method; 616, borrowing; 60, the Austrian method; and 29, a mixed method.

PRESSEY, LUELLA C. "The Permanent Effects of Training in Methods of Study on College Success," *School and Society*, XXVIII, Sept. 29, 1928.

During the last five years the author of this article has been offering a class in study methods, open primarily to probation students. The work consists of one lecture, one interview, and one two-hour laboratory period each week. The problems covered included note-taking, time budgeting, efficient reading methods, need of previous preparation. Time enough has elapsed for the effects of this treatment to be observed.

The report deals with the effects of training in methods of study upon fifty probation students in the University, whose training period was from one and one-half to three and one-half years ago.

A control group of fifty students was selected, the members being paired with the experimental group on probation at the same time. This control group received no training in study methods. Both groups were of rather low mental calibre, seventeen of the fifty in each

group fell within the third quartile in intelligence and twenty-four within the lowest quartile.

Mrs. Pressey found in comparing what had become of students in both groups, that 20 percent of the trained group were graduated but none of the untrained group. At the time of the investigation 48 percent of the trained group were receiving passing grades, compared with 18 percent of the untrained group.

A study of the table showing the relation between academic success and intelligence shows that the training saved from failure those students who were capable enough to profit by it.

The number of the trained group doing passing work before training was 5, after training 24. The author concludes: 1. That it is not worth while to try to train students below the 25th percentile in intelligence. 2. The course for probation students seems to have justified itself by the resulting academic careers of those electing it.

EXPERIMENTAL STUDIES OF TEACHING

LEWERENTZ, ALFRED S. "Summary of a Questionnaire on Methods of Classification Existing in Los Angeles Elementary Schools," *Educational Research Bulletin*, Los Angeles City Schools, VIII, (September, 1928), 10-12.

Data are given for the following items; extent of ability sectioning; reasons for not sectioning; basis for sectioning, aids employed in sectioning, manner of organizing classes, types of organization; satisfaction with plan of classification; results, attitude of principals, etc.

SPENCE, RALPH B. "Lecture and Class Discussion in Teaching Educational Psychology." *The Journal of Educational Psychology*, XIX, (October, 1928), 454-462.

A comparison of the lecture method with class discussion in two classes in Educational Psychology at Teachers College, Columbia University. The author concludes that "for two large (N equals 120-170) sections of graduate students in Educational Psychology, meeting once a week for two hours, with little previous experience or feeling in favor of the discussion method, the lecture method is superior to the discussion method in producing improvement in things measured by the tests. The major value of the experiment is to show the high degree of specificity of conditions in connection with college teaching and to point out the lack of information at present available.

The problem that must be solved is not the question, "Is Method A better than Method B or Method C?" but rather, "What are the conditions under which Method A produces most effective results? What are the situations where Method B is best? etc." There are times when the lecture method is an effective aid in securing desirable changes in students. There are other times when the lecture method is harmful and should be replaced by discussion or individual projects or something else.

The decrying of the wholesale use of lectures in college teaching is probably justified. The wholesale decrying of the use of lectures in college teaching is just as certainly not justified.

SIMS, VERNER MARTIN. "The Relative Influence of Two Types of Motivation of Improvement," *The Journal of Educational Psychology*, XIX, (October, 1928), 480-484.

The experiments here reported are attempts to evaluate the influence upon im-

provement of two different types of motivation, namely individual-motivation in which the individual competes against his own record and against that of other individuals of like ability and group-motivation in which the individual as a member of a group competes against another group. Two experiments are reported, the first using substitution of digits for numbers, as the function to be improved, the second using rate of reading. The author's controls are adequate. He concludes that "with these two types of material, rate of reading and rate of substituting, and with the groups here used, individual-motivation is vastly superior to group-motivation and group-motivation is but slightly superior to no motivation other than that which comes incidentally in learning. To the extent that reading and substitution are typical of learning in general one may say that for the groups here concerned the individual-motivation is the superior form of motivation. To the extent that these students are typical of students in general, one may say that for improving the rate of substituting and the rate of reading individual-motivation is superior to group-motivation."

STATUS STUDIES OF PUPIL ACHIEVEMENT

"A Survey of Letter Writing in Grades V and VI," *Public School Messenger.* Published by the Department of Instruction, St. Louis Public Schools, (September, 1928), 15-27.

The course of study in the St. Louis elementary schools place considerable emphasis upon letter writing. The report here referred to is based upon a survey of letter writing in the fifth and sixth grades in twelve representative schools. Pupils were directed to write a letter to a friend telling about some interesting experience connected with school life. Seventeen types of errors were listed in the directions for scoring. The following facts were brought out:

1. The letters examined in this survey show that there is a general increase from grade to grade in the length of the letter, literary merit, and the number of different words used, together with a decrease in the total number of mechanical errors found.

2. During the span of one whole grade, V-2 to VI-1, however, there is practically no change in the number of errors, literary merit, the length of the letter, and the number of different words employed.

3. In letters of the same length, neither the average length of the words used nor the percent of different words used showed any increase from grade to grade.

4. The largest amount of progress in letter writing is made in the first quarter of the fifth grade and the last quarter of the sixth.

5. Mechanical correctness correlates with literary merit in the letters studied to the extent of .54.

6. Children of the fifth and sixth grades know the parts of a letter and their proper arrangement so thoroughly that few of them make any errors in form.

7. Spelling and punctuation constitute the errors of greatest frequency.

REITERMAN, ALICE. "A Study of Achievements in First Year Algebra in Certain Los Angeles Secondary Schools." *Educational Research Bulletin,* Los Angeles City Schools, VIII, (September, 1928), 7-9.

An analysis of the achievement of 296 high-school pupils as shown by their accomplishments in the Hotz Equation and Formula Algebra Test and 298 high-school pupils in the problem tests.

"Status of the Teaching of Shorthand and Typewriting in the Secondary Public Schools of Kansas, 1926-1927," *Teaching*, a journal published by the Kansas State Teachers College of Emporia, April, 1928.

The purpose of this study was to determine the present status of the teaching of shorthand and typewriting in the secondary schools of Kansas. A questionnaire was sent to all schools having commercial subjects. Additional information was secured from the registrar's office of the Kansas State Teachers College of Emporia and through interviews with teachers and administrators. The discussion is organized into six chapters: 1. Introduction, 2. Administrative factors in the teaching of shorthand and typewriting, 3. Course of study, 4. Standards of writing proficiency, 5. Training, experience, and salaries of teachers of shorthand and typewriting, and 6. Conclusions and recommendations. The following summary is made:

1. The commercial curriculum in the Kansas secondary schools is built from the point of view of college entrance requirements rather than the pupil's needs in business. This is shown by Table I, and by the standards of proficiency for the two subjects studied.

2. Small schools are attempting to teach more commercial subjects than they can do well. This is shown by the lack of supervision of typewriting in almost one-third of the schools, the confusion in the course of study, and standards of achievement, especially in shorthand.

3. Some other type of commercial subjects which will train for the larger relationships in business, and vocational guidance are needed. This is shown particularly by the numbers of pupils who do not take enough typewriting and shorthand to make them vocationally efficient.

4. In general, the subject matter of these two subjects is adequate, but due to confusion of aims and objectives, overlapping of subject matter, and poor administration of courses, there is much waste of time.

5. The size of classes and inadequacy of teaching facilities, together with the lack of local employment, make the teaching of a second unit of typewriting and shorthand unprofitable in small high schools.

6. Teachers of these subjects in Kansas are as well trained as commercial teachers in other states, but more and broader training is needed.

MISCELLANEOUS REPORTS

CLARK, WILLIS W. "Vacation School Survey," *Educational Research Bulletin*, Los Angeles City Schools, VIII. (September, 1928), 5-6.

Tests in reading and arithemtic were given during the first and fifth weeks to 16,918 elementary-school pupils in vacation schools. The following conclusions were drawn: "On the basis of the Vacation School survey data it appears that very satisfactory progress was made by pupils in the fundamental subjects of reading and arithmetic. It also appears that the giving of standardized diagnostic tests has motivated the analysis of pupil difficulties and the provision of remedial work by the teacher and has resulted in considerably more progress than occurs without this aid. The need for variation in teaching procedures to meet the marked differences in pupil accomplishment are as pronounced in Vacation School as during the regular school year."

HAGGERTY, M. E. "Occupational Destination of Ph. D. Recipients," *The Educational Record,* (Published by the American Council on Education, Washington, D. C.) IX, (October, 1928), 209-218.

As the title indicates, the study is of the occupational destination of Ph. D. recipients. In an earlier paper the writer reported the present occupation of 1,464 persons who had received the degree of doctor of philosophy from the University of Chicago. Seventy-seven percent of such recipients now hold teaching positions and 23 percent are in engaged business and in professional work other than education. Additional data are presented in the present report from three public and four private universities. Seventy-two and five-tenths percent of those receiving the Ph.D. degree are in education; 16.3 percent are in the professions; 16.4 percent in research; 3 percent in expert governmental service; 2.2 percent in business. The writer offers the comment that it should be "clear that research is not the occupational goal of any large portion of the men and women who receive doctorates from American universities. . . . . If research were to be regarded as the exclusive aim of the graduate school or even as its primary object, the present occupation of its graduates would seem eloquent testimony of its failure to achieve its intention." He also points out that "it is clear from an examination of the data that the occupation which exceeds all others is teaching, primarily college and university teaching. . . . . In view of the fact that teaching is the predominant occupational destination of Ph.D. recipients, it is pertinent to inquire what graduate schools are doing to prepare students for their future business."

The writer has no intention of debating this issue in the present paper beyond calling attention to certain easily understood facts. In about four hundred American colleges and universities attempts are being made this year to improve the education provided for students. In the main these attempts center about four problems, the curriculum, methods of teaching, organization and administration, and the abilities and interests of students. It is fair to say that for the most part the persons who are attempting these improvements have had no specific training for the work they are undertaking other than that gained in the graduate schools. This, with native ability and "experience" makes the total equipment of these would-be-improvers of American education. Their psychology, generally gained at second hand, is usually more popular than profound, and they are curiously free from any belief that there are "principles" of curriculum construction.

NEWS and COMMUNICATIONS

Address all research news and communications to Editor Earl Hudelson, College of Education, University of Minnesota, Minneapolis, Minnesota.

The School of Education of the University of Texas has received an allowance from the Laura Spelman Rockefeller Memorial Fund for Research in the Social Sciences for a study of the education of Mexican children in Texas. The plan approved for the immediate future includes three major items:

(1) a summary of previous studies relating to the problem under investigation;

(2) a survey of present conditions with reference to legal provisions, school census, enrollment, attendance, health conditions, administrative plans, curricular adjustments, and the like;

(3) miscellaneous studies to be carried forward by interested persons—supervisors, teachers, candidates for degrees, and others—with the coöperation of the director.

The project is under the direction of a committee of which Dean B. F. Pittenger is chairman. Professor H. T. Manuel, of the department of educational psychology, is in immediate charge of the research and has been granted a partial release from teaching.

The rapidly increasing interest and participation in statewide scholastic contests makes timely the July number of the *Bulletin of Information*, published by the State Teachers College of Emporia, Kansas. The issue, containing 108 pages, and prepared by E. R. Wood, Director, and H. E. Schrammel, Assistant Director, Bureau of Educational Measurements and Standards of the State Teachers College, Emporia, is devoted to past, present, and future State Scholarship Contests, with emphasis on the nature, scope, and success of the 1928 Contests, held at Emporia on May 5. Funds for the senior scholarship event are provided each year by William Allen White. Scholastic contests are annual events in a number of states. Educators who contemplate inaugurating similar contests in still other states will find particularly valuable the account of the technique of administering the Kansas Contests and the section on Intrinsic Values and Serious Dangers of Scholarship Contests.

For the first time in its history, Radcliffe College has appointed a full-time tutor. The appointee, Miss Catherine Worthington Pierce, is also the first woman tutor in Fine Arts. She is the fifth woman to be appointed to the tutorial staff at Radcliffe. The great majority of the tutorial work, like all the other teaching, is done by members of the Harvard Faculty of Arts and Sciences.

More light is shed on the problem of high-school and college articulation by the September, 1928, issue of the North Carolina College for Women *Extension Bulletin*. Professor J. A. Highsmith of the Department of Psychology and Miss Mary Sue Beam, Student Counselor, report a preliminary study of "Why Col-

lege Freshmen Fail." Evidence is furnished on the reliability of teachers' judgments as to the causes of pupil failure, the relationship between success in the freshman year of college and the length of term in high school, a comparison of the difficulty of high-school and college requirements, and the relationship of failures to the intelligence, preparation, and reading ability of freshmen.

An unusually complete graded list of intelligence and educational tests for elementary and secondary schools, together with the names and addresses of the publishers and the price of each test, has been prepared for the guidance of teachers in the Catholic schools, Diocese of Toledo. The list accompanies general directions and semester assignments for elementary schools, 1928-1929. The bulletin is published from the office of the Superintendent, 2535 Collingwood Avenue, Toledo, Ohio.

After several months of coöperative study and deliberation, the faculty of Columbia College under the leadership of Dean Hawkes and the Committee on Instruction, has adopted a revised program of undergraduate study to supersede that which in its essentials has been followed for more than twenty years. The new program aims to "do for the great body of present-day undergraduate students what the old course of study in Greek, Latin, and mathematics did for the smaller and much more homogeneous groups two generations or more ago."

At least three-fourths of the undergraduates in Columbia College look forward to further study, either in the Graduate Schools or in a professional school. Since not all undergraduates are definite in their plans for future university work, the problem became one of adjusting the undergraduate program to those whose future plans are determined upon without unduly restricting the opportunities for students whose future courses are undecided. Accordingly the work of the first two years has been made preliminary and exploratory in character. Beyond, the offerings are more special and mature; and students who persist can no longer continue the prevalent American college custom of patching together freshman and sophomore electives to eke out their four-year curriculums. The work of the last two undergraduate years must be of genuine university character, in keeping with intellectual interests, and "in preparation either for the professional or graduate schools of the University or for the yet more serious business of living a useful and high-minded life."

Inherent in the new program is the principle that the evidence of true progress lies not in prescribed courses, or hours, or credit points, but in real achievement. Any student who can show a mastery of the content of any course will therefore be permitted and encouraged to substitute another course for which he is ready and in which he is interested.

The new program involves two experiments which in their particular forms will doubtless be watched eagerly by other colleges. One is the institution of lecture courses without prerequisites or examinations. These liberalizing courses are offered in part as a relief to students who are specializing narrowly. The lectures will be offered by men who combine the qualities of scholar and master teacher. The other experiment involves the institution of reading courses, offered in coöperation by two or three instructors in departments which, while different, are somewhat allied. These in-

structors will offer to a small group of students a course covering the field of their common interest but cutting across departmental lines. For example, a professor whose major interest is seventeenth-century French literature might coöperate with a colleague whose major interest is the English literature of the same period. One purpose of this plan is "to lessen the stiffness of the walls which separate departments, erected for administrative purposes, and to promote the largest possible coöperation in scholarly endeavor."

A letter has been received from Dr. Fred Engelhardt, Professor of Educational Administration and Chairman of the College of Education Curriculum Committee, University of Minnesota, calling attention to an erroneous statement in the September News item concerning the teacher-training curriculum investigation conducted at Minnesota by Dr. W. E. Peik. It appears that faculty consideration of the advisability of discontinuing the History of Education and Educational Sociology courses as undergraduate teacher-training courses antedated the announcement of Dr. Peik's findings. The *Journal* regrets the error and welcomes the correction.

The United States Bureau of Education has received through the State Department from Mr. J. H. Van Royen, minister at Washington of the Netherland government, announcement of the Fourth Pan-Pacific Science Congress, to be held in Batavia, Java, Netherland, East Indies, in May, 1929.

Ninety percent of all the pupils who graduated from the elementary schools of Dallas, Texas, last year entered high school.

According to the United States Bureau of Education *Bulletin*, (1927, No. 37), of 111 resident students enrolled in land-grant institutions of the United States during the school year 1925-26; 34 percent were registered for courses in the arts and sciences; 20.5 percent in engineering; 9 percent in commerce and business; 8 percent in agriculture; and 7.2 percent in professional education.

City School Leaflet No. 29, prepared by W. S. Deffenbaugh, Chief of the City Schools Division of the United States Bureau of Education, shows that material reductions in the size of boards of education in the larger cities of the United States have been made within recent years. The average number favored by authorities on school administration is 7.8. Only 14.3 percent of cities of 100,000 or more population and 13.7 percent of cities of 30,000-100,000 reporting have boards of education exceeding 9 members.

The New York Legislature has increased the number of days during which school must be in session from 180 to 190. Compulsory attendance upon part-time instruction by employed minors 14 to 17 years of age, except graduates of four-year high schools, is required in cities having a population of 20,000 or more and in districts where there are 200 or more such employed minors. Exceptions are made of children mentally or physically defective. The penalty against parents for permitting their children to violate attendance requirements was increased from five dollars or five days' imprisonment to ten dollars or ten days' imprisonment for a first offense.

The Society of College Teachers of Education at its Boston meeting, held

in February, 1928, authorized the preparation of a yearbook to be presented at the 1930 meeting of the Society on "Problems of Measurement in College." Dr. Clifford Woody, Director of the Bureau of Educational Reference and Research, University of Michigan, has been appointed chairman of the yearbook committee.

The New York sessions of Section Q (Education) of the American Association for the Advancement of Science will be held at Teachers College, Columbia University, Thursday, Friday and Saturday, December 27th to 29th. Section Q aims to present a program on education as a science, coördinate with the other scientific programs of the great Association of which this section is a part. The following general topics will be discussed: (1) the mathematical treatment of education problems, (2) recent improvements in instruments for measurement in education problems, (3) general experimental studies, (4) experimental studies in college and university education, (5) experimental studies in city school systems, and (6) unclassified experimental studies. Some of the speakers will be:

Dr. L. A. Pechstein, University of Cincinnati; Dr. Arnold Gesell, Yale University; Dr. August Dvorak, University of Washington; Dr. Percival M. Symonds, Teachers College, Columbia University; Dr. D. A. Prescott, Rutgers University; Dr. William L. Connor, Director of Research, Cleveland Public Schools; Dr. E. C. Witham, Director of Research, Wilmington, Delaware; Dr. Mark A. May, Yale University; Dr. E. L. Thorndike, Teachers College, Columbia University; Dr. C. T. Gray, University of Texas; Dr. J. R. McGaughy, Teachers College, Columbia University; Dr. W. W. Coxe, New York State Department of Education, Albany, New York; Dr. Cecil R. Broiyer, Princeton University; Dr. R. J. Leonard, Teachers College, Columbia University; Dr. L. L. Thurstone, University of Chicago; Dr. Edward A. Lincoln, Harvard University; Dr. Arthur I. Gates, Teachers College, Columbia University; Dr. Arthur W. Kallom, Director of Research, Boston Public Schools; Dr. M. E. Haggerty, University of Minnesota; and Dr. Truman L. Kelley, Stanford University.

A joint dinner of Section Q and Section I (Psychology) will be the occasion for the presentation of the addresses of the retiring vice presidents for these sections, Dr. Knight Dunlap (for Section I) and Dr. Arthur I. Gates (for Section Q). This will probably occur on Saturday evening. Doctor Dunlap will speak on "The Outlook of Psychology" and the subject of Doctor Gates's address is to be "New Movements in the Field of Educational Psychology."

All individuals interested in education as a science are invited to attend these sessions. The hotel headquarters for Section Q will be the Pennsylvania Hotel, Seventh Avenue at Fifty-fourth Street. The very great importance of education work is recognized by thoughtful people everywhere. The time is opportune for scientific studies such as those reported in Section Q.

An Experiment with an Individual Technique in Sixth Grade Arithmetic

Much interest has been shown in recent years in individual instruction. Educators are agreed that something must be done to care for individual differences. At this point agreement ceases. Each group of educational leaders has some different plan by which the problem of individual differences is to be solved. Some recommend special rooms and special teachers for retarded groups. Others insist that a three or five-track system of ability grouping with dif-

ferentiated curricula will meet the need. Still others contend that there must really be as many tracks as individuals, and that only some form of individual instruction will remedy the evils of the present system.

The writer, while teaching the fifth and sixth grades in the Gill Consolidated School during the year of 1925-26, felt very keenly the inadequacy of the classroom system to meet the problem of individual differences. There was an overcrowded schedule of classes which gave time for but little other than the hearing of recitations. Since the school was rural in nature, special teachers and ability grouping were out of the question. In searching for a better way of doing the task at hand, the writer became interested in the individual technique as it has been worked out by the Winnetka schools. With the consent and encouragement of the superintendent, it was decided to try, experimentally, the individual technique in sixth-grade arithmetic during the next school year. The primary object of the experiment became one of determining whether or not the individual technique would produce results superior to those obtained when the usual class procedure was used.

Twenty sixth-grade pupils were chosen as subjects for the experiment. Only sixteen of them remained through the year so the data presented are based on these sixteen only. The median intelligence quotient of the group, as shown by the National Intelligence Test, was 100, the lowest being 60 and the highest, 120. On October 12, 1926, when the experiment formally began, only four of the sixteen had achievement ratings in arithmetic as shown by the Stanford Achievement Test, of sixth grade or over. Table I shows that in this sixth grade at least three ability grades were really present. It also shows that these grades were not distinct, but that the pupils were fairly evenly distributed over a range of over two grades in arithmetic ability.

TABLE I

DISTRIBUTION IN GRADES OF ACHIEVEMENT OF SIXTEEN SIXTH-GRADE PUPILS IN ARITHMETIC ON OCTOBER 12, 1926, AS SHOWN BY THE STANFORD ACHIEVEMENT TESTS

Pupil's Letter Rating*	Grade Standing	Pupil's Letter Rating	Grade Standing
a	6.5	i	5.5
b	6.5	j	5.2
c	6.1	k	5.2
d	6.0	l	5.2
e	5.8	m	4.9
f	5.7	n	4.6
g	5.7	o	4.5
h	5.5	p	4.1

* The same pupil may be traced through other tables by means of his letter.

The first step toward individualizing the instruction was to divide the subject matter in the text into relatively small units of related material. This was not extremely difficult, because the text was quite self-explanatory and easily adapted to individual work. Unit or assignment sheets were prepared on each unit of the course. These were mimeographed and placed in the hands of the pupils as they became ready for them. Each unit sheet consisted of three parts, as follows:

1. Pupil's Goal, under which were listed definitely the facts and skills which the pupil was to master.

2. Assignment, which directed the pupil's efforts toward this mastery.

3. Practice Test, which the pupil used to test himself on the skills and facts set up to be mastered.

The second step was to find or prepare test materials on each unit to be used as measures of the degree of mastery attained in the facts and skills set up as objectives for the unit. It was also highly desirable to have tests of a diag-

nostic nature, so that individual difficulties could be detected and remedies applied. The Compass Diagnostic Tests were found to meet these needs for most of the units. Where these tests did not parallel the work of the units, tests were prepared by the writer.

The third step was that of revising the daily program. The class recitation was done away with entirely and in its place was put a consultation and work period. During this period unit sheets were given out, difficulties diagnosed and remedied, and tests taken and discussed. The work of this period was wholly individual except when two or more pupils encountered the same difficulty at the same time. This period was thirty minutes in length on two to three days a week—the average being one hour and fifteen minutes a week. Another hour and fifteen minutes weekly was available to pupils for independent study.

These three steps made possible individual progress, which was an essential feature of the plan. Each pupil worked from unit to unit at his own rate of speed, regardless of where the other pupils might be working.

Having now outlined the procedure used in establishing the individual technique, some concrete examples of how the plan was actually applied may help the reader to a better understanding of the problem.

During the first few days tests were given to the group on the following: reading and writing, adding, subtracting, multiplying and dividing whole numbers; and adding, subtracting, multiplying and dividing fractions. Thus far the work was group; from there on it was individual.

These tests were scored and those pupils whose achievement came up to sixth-grade standard, as shown by the norms for the tests, were credited on their record and on the teacher's record with the units on which the tests were based. Those pupils whose scores fell below the sixth-grade norms were tested in small groups or individually with the diagnostic parts of the Compass Diagnostic Tests in order to determine the particular weaknesses which caused their failure. When these were discovered unit sheets were placed in the hands of the pupils and they were told which part of the unit sheet to follow in order to overcome their difficulty. After the remedial work, testing again took place to find if the remedial work had been effective. Where difficulties still existed more remedial work was prescribed.

As soon as a pupil succeeded in bringing the work in the fundamentals with whole numbers and fractions up to standard, he was started on the new work of the course. Here the unit sheet was given to the pupil first. After he had worked out the assignment on the unit he tested himself with the practice test which he scored. If this test showed a high degree of mastery, he reported for a final test during the next consultation period. If the work on this test was of standard quality, he went on to the next unit. If not, diagnosis was made to locate the places wherein his study had been ineffective, and remedial work was given.

Several problems arose in connection with the experiment. The major problems may be listed as follows:

1. Winning parents and pupils over to individual method.
2. Grading pupils on their report cards at the end of each six weeks period.
3. Making promotions at the end of the year.
4. Motivating the work of the very slow pupils.

The first problem was handled easily

as far as the pupils were concerned. The whole plan was explained to them and they fell in line enthusiastically. Some little time was necessary for them to adjust themselves to the new way; but once they understood what they were to do, only two of the sixteen preferred the old method. The possibility of working as fast as they wished motivated the work, especially for the more ambitious pupils. The coöperation of most of the parents was secured through letters, special conferences, and talks before the Parent-Teachers' Association.

The report card problem was solved by giving incompletes to those not finishing a minimum number of units of work each six weeks. Later, as these units were finished, the incompletes on the cards were changed to passing grades.

Since the method was not to be continued in the seventh grade, pupils had to be promoted or failed at the end of the year. In making these promotions, the results of the Stanford Achievement Tests were used, those making a normal amount of progress being allowed to go on to the seventh grade.

The problem of the slower pupils was the most difficult of all. True, the method allowed them to take their own time; yet when the work was beyond their comprehension, time was not an important factor. To demote these pupils, who were already two or three grades behind, did not seem advisable. Undoubtedly, they should have had easier work, probably from a lower grade text. What was done was to give them the easier work in the sixth-grade text. However, poorly as this problem was met, the pupil with the lowest IQ of the group made .6 of a grade progress during the seven and one-half months of the experiment.

The real object of the experiment was, as has been stated, to find a better method of teaching. One way of determining the worth of a method is to measure the results obtained. In order to do this the Stanford Achievement Test in Arithmetic was given at the beginning of the experiment, October 12, 1926, and another form of the same test was given at its close, June 1, 1927. Table II shows the standing in grades of the sixteen pupils in October and in June, and the progress in grades over the seven and one-half months between the two testings.

TABLE II

PROGRESS IN GRADES OF ACHIEVEMENT IN ARITHMETIC AS SHOWN BY THE STANFORD ACHIEVEMENT TEST OF SIXTEEN SIXTH-GRADE PUPILS OVER A PERIOD OF SEVEN AND ONE-HALF MONTHS, WHEN TAUGHT BY AN INDIVIDUAL TECHNIQUE

Column 1 Standing Oct. 12, 1926		Column 2 Standing June 1, 1927		Column 3 Progress	
Pupil Letter	Grade	Pupil Letter	Grade	Pupil Letter	Grade
a	6.5	b	8.8	g	2.9
b	6.5	g	8.6	m	2.6
c	6.1	d	7.7	j	2.4
d	6.0	a	7.6	b	2.3
e	5.8	i	7.6	n	2.1
f	5.7	j	7.6	i	2.1
g	5.7	m	7.5	d	1.7
h	5.5	n	6.7	k	1.4
i	5.5	k	6.6	p	1.4
j	5.2	l	6.4	l	1.2
k	5.2	f	6.4	a	1.1
l	5.2	e	6.3	f	.7
m	4.9	h	6.0	o	.6
n	4.6	c	5.8	h	.5
o	4.5	p	5.5	e	.5
p	4.1	o	5.5	c	—.3

The normal amount of progress would have been .75 of a grade. The median progress was 1.45 grades, or .70 of a grade better than the normal progress to be expected. Of the sixteen pupils, Column 3 of Table II shows only five who failed to make the normal amount of progress. In October, only four really belonged in the sixth grade (Table II, Column 1) while in the following June, seven were ready for the seventh grade (Table II, Column 2). The lowest of these seven was as high above the seventh

grade as the highest of the four was above the sixth grade. The lowest grade rating in October was 4.1 grades (Table II, Column 1) while the lowest in June was 5.5 grades (Table II, Column 2) or 1.4 grades above the lowest in October. The range in October was from 4.1 to 6.5 grades (Table II, Column 1) or a range of 2.4 grades. By June the range had increased to 3.3 grades or an increase of .9 of a grade (Table II, Column 2). This increase in range may have been due to the freedom to work ahead allowed under the individual technique.

Since pupils were allowed to work at their own rate of speed, it naturally followed that some did much more than others. Table III gives the distribution of the sixteen pupils on the number of units completed.

The progress shown in Table II may seem hard to account for when compared with the number of units completed as shown in Table III. It is the writer's belief that a good part of the progress was due to the thorough review given in the first nine units which, as shown by Table III, everyone completed.

It was found that twelve of these sixteen pupils had been taught by the writer the previous year, 1925-26, by the traditional class method. No tests had been given at the beginning or close of this year, but the Stanford Achievement Test had been given on March 6, 1925, three months before the close of the school year of 1924-25. Table IV shows the grade progress in arithmetic of twelve of the sixteen pupils who formed the experimental group of 1926-27.

TABLE III

DISTRIBUTION OF SIXTEEN SIXTH-GRADE PUPILS ON NUMBER OF UNITS OF ARITHMETIC COMPLETED UNDER INDIVIDUAL TECHNIQUE

Pupil's Letter	Number of Units Completed	Pupil's Letter	Number of Units Completed
d	46	n	25
a	46	j	22
b	46	p	22
g	37	f	21
i	31	k	20
l	26	e	20
c	26	o	16
m	25	h	9

TABLE IV

COMPARATIVE PROGRESS OF TWELVE PUPILS IN ARITHMETIC WHEN TAUGHT BY CLASS AND INDIVIDUAL METHODS. PROGRESS MEASURED BY STANFORD ACHIEVEMENT TEST

Column 1		Column 2	
Class Method March 6, 1925 to October 12, 1926 13 months		Individual Instruction October 12, 1926 to June 1, 1927 7.5 months	
Pupil's Letter	Progress in Grades	Pupil's Letter	Progress in Grades
j	1.9	g	2.9
a	1.3	m	2.6
l	1.2	j	2.4
d	1.2	n	2.1
i	1.0	i	2.1
f	.8	d	1.7
o	.8	p	1.4
m	.5	l	1.2
g	.5	a	1.1
c	.4	f	.7
n	.1	e	.5
p	.5	c	—.3
Median Progress .85 grades		Median Progress 1.5 grades	
Normal Progress 1.3 grades		Normal Progress .75 grades	

Column I shows the progress under class instruction, covering a period of thirteen school months, ten of which were taught by the writer. The normal amount of progress to have been expected during this time would be 1.3 grades, but the median progress was only .85 of a grade, or .45 of a grade below normal.

Column 2 shows the progress of the same twelve pupils taught by the same teacher, but with individual technique, over a period of seven and one-half months. Here the normal progress to be expected would be .75 grades, but the median progress was actually 1.5 grades.

Only two of the twelve made normal progress under the class method (Table IV, Column 1) while nine made normal progress or above when taught by the individual technique (Table IV, Column

2). It is interesting to note that the median progress under individual instruction was nearly twice that made under the class method, although the time was but little more than half as long.

The writer realizes that the data presented in Table IV are based upon work in which there were many uncontrolled variables. However, since the progress made under individual technique so far outstrips that made under the class method and since the writer actually taught the pupils longer by the class than by the individual method, he feels that part of the difference, at least, was due to the methods used.

The writer believes that some form of individual instruction is necessary if our rural schools are to break free from the iron grip of the graded class system and really meet the individual needs of their pupils. The greatest handicap to individual instruction today is the lack of prepared materials to supplement present texts. Before individual instruction can go far, we must have texts written to the pupil rather than to the teacher, or carefully prepared unit materials to make our present texts more self-directive.

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